DEVELOPMENTAL RESEARCH WITH CHILDREN:

A CONTEXTUALIST PERSPECTIVE

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Abstract

Current developmental research with children is based on false dichotomies between the child and society and between mind and society. Likewise there is little development in developmental psychology, but a view of static changes. This study seeks to trace the historical context in which this psychological research takes place in order to obtain critical insight into the problem. The logical positivist traditions and influences on methodology are found to be inadequate when dealing with development as a dynamic, changing reality and with individuals who are socially constituted beings. Scientific realism is seen to be able to overcome these dichotomies with an abductive account of method. Chapter 1 traces the influence of the logical positivist movement. Its laboratory experimental approach is seen as deficient in handling changing contexts. In chapter 2 the focus turns to the current view of childhood and development which is still influenced by the atomistic and static approaches of the logical positivist tradition. Theory of mind research is seen as a prototype of current research; with its focus on competencies that manifest at ever earlier ages. The focus is on the performance as an event and not the generating mechanisms causing the change. Vygotsky's dialectic orientation offers a view of the mind in society, which investigates the child through its context of interpersonal relatedness. This interrelatedness cannot be accommodated by current methods that continue to retreat to a hypothetico-deductive framework. Chapter 3 offers a developmental perspective by exploring different methodologies that might accommodate different ages. The abductive approach to scientific method within a scientific realist framework, is suggested as accommodating a truly developmental perspective. This approach suggests a change in attitude to methodology with a focus on generating theory based on problems. It also encourages a more collaborative approach to research which would take longer, as seen with the microgenetic method, but produce better quality results.

".....as human beings, we must inevitably see the universe from a centre lying within ourselves and speak about it in terms of a human language shaped by the exigencies of human intercourse. Any attempt rigorously to eliminate our human perspective from our picture of the world must lead to absurdity."

Polanyi (1958)

Introduction

The theoretical worldview on which most current empirical research is based, is an inherited set of conceptual categories that continues to have a logical positivist orientation (Hooker, 1975). This has determined the prevailing view on the nature of science, which in turn has undergirded most research done in most scientific fields. Its view of epistemology portrays science as concerned with the validity of knowledge - a task which has traditionally been seen as problematic and in need of justification, proof, or validation. The primary aim of logical positivist science, then, has been of justification in the form of verification. While much of the philosophy attached to this tradition has been abandoned, its presence is still to be seen in the methodological assumptions that undergird most scientific research.

The logical positivist view of theory plays an organizational role in the formation of knowledge as opposed to a generative role. This has prevented many from recognising the important role that theoretical research can play in challenging the prevailing logical positivist paradigm and offering alternative theories of knowledge and science. This thesis seeks to demonstrate how current methodologies used with children in developmental psychology maintain an adherence to logical positivist traditions. While many researchers will claim to have broken with the tradition, their use of methods belie such claims. Many researchers seem to find scientific realism an attractive view of science, yet little corresponding change is made to their methodologies. With this in mind, it seems useful to locate the historical background of current scientific research as well as the context in which the researcher resides. The context in which the research is itself done is dependent on these aforementioned factors. According to Hooker (1987) any account of science must involve the evolution of the biological, institutional and cultural context within which the scientific enterprise has been conceived and operationalized. Most psychological research has ignored this broader focus as it continues to be based on a paradigm which seeks to reduce

things to atomistic facts, and fails to acknowledge the socio-cultural context of its subjects and objects, of its researchers and researched.

Rationality is held up as the triumph of humanity, with our ability to reason through events and act logically, to plan for the future and to create technology and science. Rationality is however just one ability in a cluster of human abilities, which traditional research has ignored. Our minds evolved on the same adaptive basis as the rest of biological evolution, using the processes of random generation and selection of what is generated (Ornstein, 1991). Humans have a multitude of interconnecting competencies. Science has sought to tap only a few of these, primarily behaviour and now cognition; the others are ignored as are their effects on behaviour and cognition. The present scientific context has developed from a philosophy of science which has had a strong logical positivist emphasis and a resulting lack of global perspective. It has sought to impose its worldview of verification and subsequent reductionist methodology on all species, regardless of their status on the evolutionary ladder and regardless of the appropriateness of this perspective across different cultures.

In order to understand something, it is helpful to trace how it came about or evolved. Therefore in Chapter 1 the present context is traced back to earlier times in order to place the approaches and dilemmas facing psychology today in perspective. The approaches of two of the most famous developmental psychologists of the century, Lev Vygotsky and Jean Piaget are worth considering. Vygotsky is widely acclaimed for introducing the historical approach to the development of higher psychological processes. He saw the need to search for specifically human behaviour in history and not biology, believing that the object of psychological explanation is regulated by historical rather than biological processes. Thus for Vygotsky the search for laws of development had to be conducted on the sociocultural level of reality and an appropriate methodology had to be devised (Wertsch, 1985). On the other hand, Piaget believed that biological maturation explained the emergence of higher forms of behaviour. Although they had different views about development, both Piaget and Vygotsky expressed concerns about psychology near the turn of the century. Vygotsky (1982a) described psychology as being in crisis because

there was no overarching theoretical framework available for an integrated internally consistent explanation of human psychology. Empirical findings, hypotheses and theories were not interrelated and often seemed contradictory. It would appear that concerns of both psychologists are as relevant today as they were then. The separation of science from philosophy, facts from values and the subsequent dominance of positivist scientific knowledge this century, are factors that need to be addressed if one is to properly understand current psychological research.

The positivist notion of having unity of method with the natural sciences has traditionally forced the social sciences to adopt a methodology that is appropriate with the subject of the natural sciences, but inappropriate for the subject of the social sciences. The context in which empiricist methodology takes place, the laboratory experiment, is not just a methodology, but also carries the additional force of a substantive theory. Its appropriateness in investigating the social sciences has been attacked by those who would see a complete separation between the natural and social sciences. The hermeneutic tradition has arisen in response to the failure of the natural science approach to accommodate the subject of the social sciences. Its focus is on the meaning and activity of the intentional agents who are held to be the true subject matter of the social sciences. It denies that research with animals has anything to do with research on humans.

This lack of a unitary framework is not new and has plagued psychology's progress for most of its history. Dissatisfaction with the positivist tradition in psychology has led some to propose the separation of psychology into many sciences, while others prefer to take psychology right out of the scientific domain. Some would see psychology as being outside of science and belonging more to the arts. This all turns on what one's view of science is.

The scientific realist notion of science seems to offer a framework within which the natural and social sciences can co-exist, without compromise on the part of the social sciences. Bhaskar's (1975) anti-positivist naturalism and Hooker's evolutionary naturalist realism appear to accommodate the hermeneutic ideals of science that are

sited in historical, social and ecological activity as well as offering the concept of a critical theory of science. According to Hooker (1987) the scientific realist global theory aims to explain how humans behave and how they come to know what they do about what they do. There is no class of accepted truths that can serve as the foundation for this endeavour; instead reality is known only through our attempts at theoretical description. Vollmer (1988) suggests that it is not the goal of epistemology to give absolute justifications for claims to knowledge or truth. While one might wish to have perfect knowledge, such wishes are fulfilled only in the unrealistic foundations of foundationalist epistemology. Thus for Vollmer we have a straightforward choice between perfect knowledge about nothing or imperfect knowledge about the real world. The real task of epistemology is the explication of our concepts of knowledge and the analysis of such a commitment to such conceptions. Furthermore, epistemology has the task of distinguishing between subjective and objective structures, between descriptive and normative concepts and between constitutive and regulative ideas. The methodological conditions for successful inquiry need to be elucidated as well as the specification of the limits to our knowledge. This view of epistemology accommodates a view of science different from logical positivism. Much research is done without cognisance of a realistic worldview or epistemology; such is the stranglehold of logical positivism.

This study begins in Chapter 1 by tracing the historical context in which present day scientific research is situated. The logical positivist influences on 20th century science are seen to be maintained in the laboratory experiment paradigm. This commitment to positivist experimentation has determined much of the research carried out in psychology. Constructs that cannot be investigated using this methodology have been ignored or relegated to non-scientific status. It is argued that much of what constitutes human interactions cannot be investigated through use of this methodology. This paradigm fails to acknowledge the social nature of its subject matter as well as the dynamic nature of the reality in which the subjects reside. All this is passed over for variables that can be measured and controlled. A science that cannot accommodate its subject matter because of a restrictive methodology is in need of critical reappraisal. It is argued

that a scientific realist account of science provides a perspective which will accommodate methodologies that are suited to study historically situated individuals who reside in a changing world.

With an appropriate scientific framework recommended, Chapter 2 explores the current psychological understanding of childhood and development. Once again the logical positivist influence is seen with the view of the child as an isolated, independent entity; little recognition is given to the socio-historical context in which the child resides, context is treated as a variable which must be controlled. Thus the orthodox view of childhood seems to be determined by what the child can bring to the laboratory.

Vygotsky and Piaget's views on development are traced and seem to indicate more of a genuine developmental focus than does current research. Current research seems to focus on development in terms of static changes, and is unable to contend with the notion of change itself other than as an event. The current practice of demonstrating how children acquire competencies at earlier ages than was previously thought possible is revealed in theory of mind research. This is used as a prototype of current research trends, with its emphasis on finding whether a child has a theory of mind at two, two and a half, three, three and a half or four years of age. There has been a flurry of activity in devising specific 'false belief' tests which aim to test whether the child is able to understand misrepresentations. From this claims are made as to whether the child has a theory of mind and whether that theory is representational or not. The focus of the tests has been to establish the age at which this understanding seems to occur. It would seem that precisely the criticism that was ill-advisedly levelled at Piaget for using age as a criterion could be made against theory of mind investigations. The validity of such tests in real life situations appears not to be of concern to the researchers. Nor does the fact that there is a good deal of uncertainty in science as to precisely what a theory is. Theory of mind research appears to be research that is done within a paradigm that is held somewhat uncritically. Hobson (1991) argues that children acquire knowledge about the world through the experience of affectively charged interpersonal relations. This is a Vygotskian notion, where

psychological functions occur first on the interpersonal plane. The focus of research needs to bear this in mind when it attempts to assess children's understanding of concepts. The motivation of assessments with children is suggested by Meacham (1991) as arising from a desire to intervene. This is seen as the domination of nature against which Meacham warns.

Chapter 3 investigates alternative methodologies which can be appropriately used with different age groups. From this a developmental attitude towards method is suggested, where customary methods have not differentiated between age groups. Grounded theory, the methodology of Glaser and Strauss, is explored as an alternative to hypothetico-deductive methods. Haig's (1995) related abductive theory of scientific method is seen as a recasting of grounded theory, operating within a scientific realist framework of science. Here the focus is on theory generation and discovery as opposed to verification and empirical testing, offering a far broader range of research possibilities. The microgenetic method is used as an illustration of a truly developmental method, which employs different strategies to focus on the change that occurs in development. Narrative writing and assisted autiobiographical methods are seen to cater for individuals who have a wider linguistic repertoire than children. None of these are meant to be exclusive methods, but are intended to complement each other when appropriate. A scientific realist approach to science puts development back into developmental psychology.

1

The Scientific Context

With Hooker's recommendation that any account of science must involve the evolution of the broader context within which the scientific enterprise has been conceived and operationalized in mind, I intend to place psychology in its present day context by tracing the historical development of the philosophical basis of the various social sciences, including psychology. The ancient Greeks' concept of knowledge and its relation to philosophy and the philosophy of science that emerged is relevant in this regard. The final divorce of philosophy from science at the end of the nineteenth century, coincided with Comte's characterization of the positive state of knowledge. This positivist notion of knowledge has resulted in a philosophy of science which denies the possibility of any a priori knowledge and restricts knowledge to what is in experience. A methodology of experiment has emerged which is based on a mechanistic model of man, a Humean conception of cause and a methodology based on logical positivism (Harré and Secord, 1972). The laboratory experiment is the site of preferred knowledge, where individual variables are manipulated and dependent variables assessed. The results that are obtained are then inappropriately generalized back to the original context out of which the subject was taken.

This has led to the naturalist/anti-naturalist debate which is reflected in the fragmented approaches of current psychology. Anti-naturalists contend that social behaviour cannot be treated as responses caused by stimuli and must be seen as actions of agents which are mediated by meanings; thus there are many critics who feel that the naturalist tradition in science is an unsuitable context in which to conduct any of the social sciences. The remedy, as suggested by the hermeneutic approach is to separate the two. This was seen with the separation of science from philosophy and mind from matter in behaviourism. Many in the hermeneutic tradition favour a theory of activity or events in which the agent's meaning is paramount. Proponents of this ideal have taken up some of Lev Vygotsky's ideas about activity

theory, however they seem to have misinterpreted his position to mean a setting in which events or acts unfold. His intention was rather to present activity theory as a revolutionary critical activity in which meaning-making could occur.

The realist tradition appears to be able to offer a theory which can integrate the different approaches into a critical account of science. Bhaskar's (1979) anti-positivist naturalist realism is an account which offers a unified scientific view on the natural and social sciences, yet allows for significant differences between them based on the differences in subject matter. Hooker's (1987) evolutionary naturalism which is based on the realist view of science, similarly offers a unified view of humans and their world, yet honours the differences that make humans distinct. The realist view of science seems to be able to offer the synthesis that in the past has defeated scientists in their mind versus matter debate. The methodology of this realist approach seems to still be its infancy, with many in psychology reverting back to a reductionist individualism. This then, is the intellectual environment in which psychological research is currently taking place. It will be illuminating to see where theory of mind research locates itself, in this regard.

1.1. EARLIER NOTIONS OF KNOWLEDGE

The constructive aim in perusing the history or development of something is to be able to offer better insight and critical awareness into the present state of affairs. Habermas'(1971) exposition of the relationship between philosophy, science and knowledge is worth considering as a historical account of the state of current scientific practice. He traces the early relationship of theory, or theoria, to the cosmos. In philosophical language, theoria was transferred to the contemplation of the cosmos. When one talks about pure theory one invokes knowledge of an apparently objective world of facts that has a transcendental basis in a prescientific world. This early conception saw knowledge as having a transcendental and objective basis in philosophy. The connection between theoria and the cosmos was, however, abandoned and the theory of knowledge has been replaced

by a philosophy of science. Transcendental knowledge or metaphysics was abandoned to philosophy; it was not seen as an empirical science.

In 1875 Comte characterized the positive state of knowledge as follows:

> In the final, the positive state, the mind has given over the vain search for Absolute notions....and the causes of phenomena, and applies itself to the study of their laws, that is, their invariable relations of succession and resemblance. Reasoning and observation, duly combined, are the means of this knowledge. What is now understood when we speak of an explanation of facts is simply the establishment of a connection between single phenomena and some general facts, the number of which continually diminishes with the progress of science, (vol. 1, p. 2).

According to Manicas (1987) Comte saw scientific knowledge as a hierarchy starting with social physics, physiology, chemistry, physics and finally astronomy. He had no place for philosophy or psychology in his hierarchy, as they were metaphysical.

In 1890 Hegel accepted the distinction between philosophy and empirical science, but defended philosophy as a legitimate inquiry in the pursuit of knowledge. The final divorce between philosophy and science occurred around the end of the nineteenth century. According to Habermas (1971) a philosophy of science emerged in which science was no longer one form of possible knowledge, but rather the sole form of knowledge. Inquiry into the conditions of possible knowledge was meaningfully carried out only in the form of methodological inquiry into the rules for the construction and corroboration of scientific theories. This was the context in which doctrines were worked out. Positivism, the dominant view of science, used elements of empiricism to strengthen science's belief in its exclusive validity of the observational fact, instead of reflecting on it and accounting for the structure of the sciences based on this belief. Metaphysical questions were not seen as a part of science, but were the domain of philosophy, which no longer had a claim to knowledge. Thus philosophy has no role outside of critique, and by replacing the theory of knowledge with a philosophy of science, positivism protects

scientific inquiry from epistemological self reflection. The meaning of knowledge is defined by what the sciences do and can be explicated through the methodological analysis of scientific procedures. This restrictive view of knowledge from a positivist science has been the dominant context in which most scientific research has taken place this century.

According to McCarthy (1984) positivism has subsequently disintegrated as a distinct philosophical movement and it is difficult to specify a common positivist perspective from Comte, Spencer and Haeckel's evolutionary positivism to the phenomenalism of Mach and Avenarius and the logical positivistm of the Vienna circle. It has however, been absorbed into the traditions of empiricism, pragmatism and linguistic analysis. Its problems and techniques, concepts and theories all pervade contemporary thought. Theories must make assertions at the observation level, according to the positivist empiricist analysis of science. Positivism adopts the rule of empiricist schools that all knowledge has to prove itself through the certainty, or near certainty, of systematic observation. The exactitude of this knowledge is guaranteed only by the formation of theories that allow the deduction of lawlike hypotheses. Any epistemology that transcends this framework of methodology will succumb to the same sentence of extravagance and meaninglessness that positivism once passed on metaphysics.

According to Manicas (1987) psychology was launched as an autonomous science by Wundt in 1873. Wundt's physiological psychology gradually shifted towards experimental psychology between this time and 1911. Zuriff (1985) describes behaviourism as a psychological version of positivism, as both have attempted to isolate metaphysical questions by directing their focus towards positive knowledge. Thagard (1992) describes the replacement of introspectionism with behaviourism as occurring for methodological reasons. The call to study objective behaviour rather than subjective experience made psychology sound more scientific, recalling the dominant scientific ethos of the time. Likewise the task of social psychology has been to develop theoretical laws governing human behaviour. These laws are developed on the basis of systematic

observation and derivations are tested through subsequent experimentation. Observation and testing proceed on rigorous grounds, ruling out any potentially biasing factors and insist on replication by anyone doubting their validity. In this way science can provide a repository of funadamental, empirically validated knowledge (Gergen, 1979).

1.2. EXPERIMENTAL PSYCHOLOGY

According to Harré and Secord (1972), and as noted above, three fundamental ideas of positivism have been taken for granted in providing a sound methodological and theoretical foundation for a context in which behavioural science occurs: a mechanistic model of man, a Humean conception of causality and a methodology based on logical positivism. The more that psychology has honoured these conceptions, the more scientific it has claimed itself to be. The laboratory experiment is placed at the centre in psychology's search for knowledge and has determined much of the research carried out in psychology. This has led to an emphasis in research with animals, not humans, and a restriction of research to kinds of experiments where phenomena are analyzed into dependent and independent variables. This experimentation consists of manipulating independent variables and observing and correlating the subsequent changes in the dependent variables.

1.2.1. The Mechanistic Model of Man

Psychologists viewed people as objects who were passively affected by events in their environment. Their behaviour could be explained by a combination of effects of external stimuli and prevailing organismic states. This led to the view that people would respond to the push and pull of forces exerted by the experimenter or the experiment, like an animal. The contribution of factors internal to the organism were minimized as much as possible, hence the possibility of the subject being an active agent was excluded. Finally there was the belief that wherever a cause of the same type existed, the effect would be the same; thus the possibility of any contextual influence was completely ignored. This mechanistic model of man was seen to

be the only one that would satisfy the requirements for psychology to be regarded as a positive science.

1.2.2. The Humean Conception of Cause

The most scientific conception of cause was one which focussed on external stimulation and excluded from consideration any mode of connection between cause and effect. Causal laws were understood to express constant correlations of stimuli and responses; this excluded from empirical science any connection between cause and effect. This follows the approach of Hume's regularity theory, where there is a regular sequence of one kind of event which is usually followed by another of the kind (Harré and Madden, 1975). Radical behaviourism gave external stimuli the status approaching that of efficient causes and organismic forces were regarded as conditions that were subservient to the primary impact of the external stimulus; thus any spontaneity or agency was discounted. This view of causation is associated with a deterministic and mechanistic view of human responses.

1.2.3. Logical Positivist Methodology

A methodology based on these principles was viewed as the best possible approach to a behavioural science. It required a verificationist theory of meaning and an operationist theory of definition; these were the legacies of the 1920 logical positivists of the Vienna Circle. The meaning of terms was given by the way statements in which they occurred could be verified. This resulted in an atomism of propositions where propositions were reduced to their elementary constituents. Basic facts were taken as 'atoms of experience' from which complex propositions could be constructed by using elementary formal logic. The role of theory was restricted to providing a framework for the organization of given facts.

1.2.4. Laboratory Experimentation

The aforementioned assumptions imply a methodology that is restricted to simple manipulations of independent variables, which themselves are allegedly causes of behaviour. The assumption is that complex behaviour is merely an additive function of simple behaviours. This would explain the primacy that experimenters gave to experiments with animals; procedures were simpler and more manageable and produced more knowledge of the basic elements of which it was assumed behaviour was composed. It is here that operations can be performed that verify the causal link between antecedent and consequent events.

Harré and Secord (1972) claim that the experimenter treats the experimental paradigm as if its operations represent the concepts themselves. Empiricism is overemphasized at the expense of conceptualization. It is as if experimenters believe that observation and experiment by themselves can create a science. This is an offshoot from the logical positivist view that theory is an instrument has a merely organizational role. Psychologists still believe that the way to clarify concepts is to invent experimental operations and do experiments. They overlook the fact that they still have to be linked up with the social situation outside the laboratory. Experience, however, is not the passive reception of sensory inputs. Nor is thought a thing that happens to humans; it is something that humans do.

By contrast Vygotsky's view on the state of research in the 1920s and 30s expressed his suggestion that psychology incorporate a wider perspective on knowledge," Fact and philosophy are directly interrelated...If we want to find the key to this rich collection of new facts, we must first clarify the philosophy of the fact, the philosophy of its acquisition and interpretation. Otherwise, the facts will remain silent and dead," (Vygotsky, 1987, p. 55 in Newman and Holzman, 1993). However, this was ignored as behaviourism began its rise to ascendancy. Habermas (1971) believes that replacing epistemology with a philosophy of science has led to an epistemology that is largely restricted to methodology. Subjects have lost their significance as inquiry into the knowing subject has been renounced; subjects of

knowledge have been reduced to nonsocial entities. The meaning dimension of knowledge for the knower itself has become irrelevant in the pursuit of rigorous knowledge and has been replaced with the meaning of facts, whose connection is described by theoretical propositions. Habermas believes that the fundamental connection between knowledge and interest will only be found when objectivism is dissolved in methodology. It is the task of a critical philosophy of science that escapes the snare of positivism, to demonstrate different categories of possible knowledge. Traditionally, the glory of the sciences has been seen to result from the unswerving application of their methods without regard for their knowledge-constitutive interests. Such a view, however lacks a means of dealing with the problems that appear once the connection of knowledge and human interest has been comprehended.

Gergen (1985) cites the positivist influence of building scientific theory according to the cult of the fact. This is in line with early positivist theory which held that factual observation had to precede the construction of theory. This induction from fact to theory is seen to involve a move from the particular to the general. Thus what psychologists choose to call facts already presume a theoretical attitude. He claims that knowledge of the world is not a product of induction and hypothesis testing; nor is the process of understanding the world a result of the forces of nature, but a result of an active, cooperative enterprise of persons in relationships. Consideration has to be given to alternative theories of knowledge and criteria for assessing theoretical claims. The deployment of empirical data to justify and evaluate theoretical propositions is no longer credible and continued research within a given paradigm does not increase its applied value, but rather sustains a particular point of view. The construction of understanding according to one single perspective is limiting, whereas a multiplicity of perspectives contains survival values and breaking with the paradigm has more value than continued striving for verification. These ideas are congruent with Riegel's (1973) dialectical orientation to the generation of knowledge, which maintains that it is through comparison of competing perspectives that greater understanding is achieved. It would appear then that the positivist notion of science is a restricted one and that

only research that matched this view of science would be tolerated. The fact that the methodology was often inappropriate for research on humans was beside the point, as it was rigorous knowledge that scientists sought. Gergen (1985) claims that the positivists placed greater value on knowledge as an endpoint than on the means through which it is obtained. The ultimate utilization of knowledge was not given much attention; its quest was considered redeeming in itself.

1.3. THE NATURALIST VERSUS ANTI-NATURALIST DEBATE

The natural science approach which underlies the experimental method is the dominant paradigm in psychology. It is the legacy of the Vienna Circle logical positivists of the 1920's and 1930's. According to McCarthy (1984) this approach emphasized the unity in scientific approach where, despite differences in specific concepts and techniques in different domains of inquiry, the methodological procedures of natural science were considered applicable to the sciences of man; the logic of inquiry in both is the same. The goals of the inquiry are explanation and prediction. The scientific investigation of social and nonsocial phenomena was aimed at discovering lawlike generalizations that could function as premises in deductive explanations and predictions. The hallmark of scientific knowledge was its testability and to test a hypothesis, one used deductive logic to derive observation statements, whose falsehood would refute the test hypothesis. The hypothetico-deductive method was the means by which causal relationships were established. The empirical base of science was thus composed of observation statements that were said to report perceptual experiences or be motivated by such experiences.

According to McCarthy (1984), Max Weber attempted to bridge the gap between the social and natural sciences and make possible the treatment of the social and the material in a systematic scientific manner. Weber defined sociology as a science that tries to understand social action in terms of causal explanations. He saw explanatory understanding as the placing of a particular act in an understandable

sequence of motivational actions that corresponds to an empirically verifiable regularity of behaviour. Habermas (1973) criticizes Weber for seeing the primary task of scientific analysis as discovering empirically reliable regularities of social action with a view to their employment in causal explanations and conditional predictions. For him the need for understanding the meaning of social actions is of secondary import. Habermas believes that the failure to understand meaning is the Achilles heel of the positivist theory of science.

Vygotsky argued against a single-factor theory of development with a single explanatory principle. His argument was mainly aimed at biological reductionism and mechanistic behaviourism that were common practice in the 1920s and 1930s. He believed that there are multiple forces of development each with their own set of explanatory principles. For him the dynamics of ontogenesis rests on the assumption that the natural line of development, which produces functions in their elementary forms, may operate in relative isolation in early childhood. It is soon integrated with the cultural line, which is the elementary converted into higher psychological functions, through a process of emergent interactionism (Wertsch,1985). Thus for Vygotsky, psychological functions emerge out of the social context and it is here, that he believed researchers should focus.

Explaining behaviour requires not only psychological theory but also situational, biographical and historical information, in other words, contextual information. Psychology has for the most part tried to force its subject matter into the natural science mould by trying to study it in isolation from its context. Habermas (1971) criticizes behaviourism's attempts to transform statements about intentions and actions into statements about observable behaviour or into empiricist language. Statements about intentional actions belong to another level than first order statements about physical objects and their behaviour. Behaviourist theories of language fail in their attempts to reduce linguistic communication to verbal behaviour. Attempts to reduce meaning to behaviour fail to appreciate the internal connection to ideas that are constitutive of behaviour at the human level. Generality of knowledge gained from studies of animals, and within a narrow context, is severely limited. Human social

behaviour is meaningful behaviour, involving agents with intentions and expectations who are capable of choosing courses of actions (Koch, 1981).

1.3.1. Hermeneutics

According to Bhaskar (1979) the hermeneutic approach to science, founded in humanist culture, arose as part of the anti-naturalist reaction from the work of Schleiermacher (1838). This approach appeals to a difference in method between the natural and social sciences, based on the difference in subject matter. It believes that the elucidation of meaning and the tracing of conceptual connections is what the social sciences should be concerned with. It contrasts the science of the physical non-human world of nature with the science of the world of the mind, culture and history. For positivists, science is outside society and for hermeneutics society is outside science. Winch (1959) sees the difference between science and hermeneutics residing in both their methods and categories. Social science's method is conceptual and its main category is that of meaning; the natural sciences method is empirical and its category is causality. For Winch the natural sciences are concerned with causally regular behaviour, claims about which are found in observations of externally related elements. The social sciences are concerned with meaning and rule following with their main aim being establishing the connection between actions and meanings they express. Thus for Winch, explanation is achieved by understanding the way subjects give meaning to their lives.

Bhaskar (1979) sees the gross inapplicability of positivism to social science as accounting for the plausibility of hermeneutics to hermeneuticists. The human sciences stand in a subject-subject relationship rather than a subject-object one; the difference between these relationships must be reflected methodologically. All theories of orthodox philosophy of science and their methods presuppose closed systems; hence they are inapplicable in the social sciences. For Bhaskar the Humean theories of causality and law, deductive-nomological and statistical models of explanation, inductivist theories of scientific development and criteria of confirmation, Popperian

theories of scientific rationality and criteria of falsification, and hermeneutical contrasts parasitic upon them, must all be totally discarded.

Bhaskar claims, however, that both positive naturalism and hermeneutics have a common commitment to the ontology of empirical realism and individualist sociology. Societies are real objects which are irreducible to simpler ones; hence he argues against methodological individualism. Likewise, the positivist tradition has to confront the problem of the direct scientific study of phenomena that only ever manifest themselves in open systems, where invariant empirical regularities do not obtain. The absence of closed systems does not mean that there are no social laws, but the criteria for rational assessment of theories cannot be predictive and therefore have to be explanatory. The identification of laws and empirical regularities are impossible outside closed systems. In the natural sciences the conditions for closed systems are sometimes there. The positivist leans on empirical criteria for ascribing reality to knowledge claims. This cannot do justice to the social sciences and psychology, where the objects cannot be made empirically manifest. Human sciences can be sciences in exactly the same sense, although not in exactly the same way, as the natural ones. For Bhaskar the root problems between the naturalist and anti-naturalist approaches lie in their acceptance of the anti-scientific trinity of empirical realism, sociological individualism and a commitment of the epistemic fallacy. Both Mead and Vygotsky rejected individual psychological reductionism. For Vygotsky, investigating individual responses before the collective, deals in his opinion with the second level in development.

1.3.2. Activity Theory

Harré and Secord (1972) call for a distinction to be made between the theory of movements, which is physiology and the theory of actions, which is the province of psychology. They claim that psychology has been studied without reference to its major phenomena, namely meanings, and without taking account of its main behaviour generating feature, namely the agency of people.

For Harré and Secord psychological activity is characterized by a reduction of biological determinants rather than a reduction to biological determinants. Human activity involves constructed responses whereas animals exhibit primarily biologically determined immediate responses to stimuli. Social acts are practical interactions which organize the psychological existence of humans. This is in agreement with Leontyev's activity theory which holds that thought is inseparable from practical social action (Leontyev, 1981). If one wishes to ascertain the child's thought about something, one needs to take account of his activity. Thus when we see an action we connect what we see with a context which is conceptually different from the context of seeing movements.

According to Harré and Secord (1972) human behaviour does not have the characteristic of things happening to it, rather it consists of things that people have made happen for various reasons. A person is the cause of their own actions; he or she is an agent taking care of his or her own acts. Action has significance and meaning and occurs in a social, not physiological, context. Action is the basic empirical concept and is different from movement. Movements are the vehicle for action. Harré and Secord maintain that the true subject matter of psychology is complex and deliberate actions. People are capable of intiating actions which may take place only after deliberation. The action sequence may be anticipated in a more or less clearly formulated plan. Most human action cannot be traced back to antecedent events. Harré and Secord believe that because an explanation makes references to plans, rules and intentions, this does not preclude it from being scientific. Attempts to characterize actions as movements result in a loss of meaning and character. Action is psychological and cannot be reduced to physiology or observed behavioural elements without being destroyed. Activity has always been eliminated from psychophysical experiments by vigorous controls. However, Gibson (1979) found that when he placed his subjects in an active, exploratory role that the crucial explanation of how we perceive lies in apprehending the invariances in our environment through active exploration. If this is so, then no amount

of experimentation in the framework of psychophysics will enable us to explain everyday perceptual phenomena.

Contextualists stress the event as the unit of analysis. It is seen as a concrete action of everyday life that is set in time and consists of relations and activities that are continually changing. According to Jaeger and Rosnow (1988) this situates human activity within a sociohistorical and cultural milieu of relationships. Reality is constantly changing in contrast to the positivist notion of invariant order. Thus understanding and knowledge are no longer seen as linear process models of cause and effect but are loosely based on a synthesis of actions, events and experiences. According to this model, the ways of explaining have to do justice to the way the individual relates to their reality. The experiment is no longer accorded a primary explanatory function as it does not do justice to an unfolding event. Contextualism thus emphasizes the relativity of knowledge, for it is knowledge of action within specific socio-historical and cultural contexts that applies to developmental and transformative processes.

Lev Vygotsky devoted much of his time to formulating the role of the social and historical context in psychological research. Much of his effort was stimulated by the need to create a Marxist psychological tradition. Many of his ideas, which have only recently been circulated and translated, are being taken up in the West. Many of his ideas were in unfinished form and his empirical claims untested due to his early death. His works were subsequently banned by Stalin and whilst some of his colleagues, like Leontyev and Luria, continued to work on his ideas, they have only recently become widely accessible.

Vygotsky (1978) saw practical human activity as playing the role of a general explanatory category and this activity as being the link between the external world and the human mind. Thus, for Vygotsky activity was not the subject of scientific inquiry, but was the explanatory principle in his work. He saw mental processes as determined by historically developed, practical activity that incorporates tools. The semiotic mediation of human activity is what transforms humans. He drew a distinction between behaviour and action: action is located within specific cultural and historical

perspectives and time and behaviour as a mechanical description without narration.

Many theorists have taken some of Vygotsky's ideas and used them to support their cause. Social constructionists have claimed him for their own, with his emphasis on the importance of word meaning. Others have taken his concept of the Zone of Proximal Development as an example of how to analyse the concept of activity in a natural setting as opposed to a laboratory. Most of his ideas are obtained through translations, some of which are contaminated by western conceptualization. Van Der Veer and Valsiner (1991) criticize the westernized versions of Vygotsky's theory which ignore the qualitative approach and interests he had in the dynamics of cognitive change. Newman and Holzman (1993) criticize the way the Marxian concept of activity has been passified into a setting. The zone of proximal development is not a place, but an activity in which we materially reorganize what there is to create a new meaning for everything. It is therefore not a zone, nor is anything in it. It is an anti-paradigm, a unity of historical nature, where what is essentially human emerges in meaning making activity. Newman and Holzman claim that the Zone of Proximal Development concept is threatened by a eurocentric bias and it is not a technique for individual or group learning. While it is gratifying to see how scientists are looking back into their past, they are not reworking old ideas as would be the case with a return to Piaget. Vygotsky's work is new to most and its novelty makes many forget the historical context in which he developed his views. Knowledge of his cultural and historical context would aid people in their understanding of his ideas. His views on word meaning and activity would not have placed him in the constructionist and hermeneutic camp, as he appeared to be seeking a more Marxian critical theory of science which would result in emancipatory action.

The other side of the coin from activity theory as the object of inquiry, is the fact that scientific inquiry itself is a human activity. Actions in which scientists engage like observation, experimentation, measurement, concept formation, theory construction and testing are subject to certain rules, norms and standards. According to McCarthy

(1984) the scientist is part of the social reality they wish to analyze. Their problems, interests, concepts and judgements all arise from, and belong to, the very traditions and institutions under investigation. Thus a theory that is critical needs to be conscious of its own origins in the historical and further development of society.

Bhaskar's (1975) view of activity theory is that society would not exist without human activity, but it is not the product of human activity. Society is the condition and the outcome of human agency. Humans, however, do not create society, they reproduce and transform it. Society always pre-exists people and is a necessary condition for their activity; it is an ensemble of structures, practices and conventions which individuals transform or reproduce, but would not exist unless they did so. Thus social structures unlike natural structures do not exist independently of activities they govern, nor do they exist independent of the agent's conceptions of what they are doing in their activity and, unlike natural structures, they may be only relatively enduring. According to Manicas (1987) social structures are almost never conscious and purposively produced, reproduced or transformed even though the activities on which they depend are conscious and purposive. Thus human action is the medium of social structures and it is with this that psychology is concerned. There is a difference in possible objects of knowledge between the natural and social sciences. In the natural world objects of knowledge exist and act independently of the process of production of knowledge of which they are objects, unlike the social sciences. Bhaskar (1975) believes that the positivists ignore this interdependency and the hermeneuticists dissolve the intransitivity, where objects of knowledge do not depend on human activity.

Hooker (1987) believes that one can give recognition to the historical and social dimensions of science, without incurring the social, cultural and political relativisms. He states that it is a mistake to believe that once science is acknowledged as a human activity, all prospects of epistemic objectivity disappear and are replaced with historical, sociological or political explanations. He believes this occurs because of the mistaken belief that there is only one kind of objective account of science possible. The appeal of the hermeneutic and activity

tradition seem to lie in placing behaviour, empiricist behaviour, in a context, with the view to making it more valid. It is still managed however, in the laboratory experimental paradigm, according to the natural science tradition, as Bhaskar points out.

1.4. A REALISTIC THEORY OF SCIENCE

Bhaskar (1979) believes that society can be studied in the same way as nature by an anti-positivist naturalism, which is based on a realist view of science. This view sees significant differences in methods between the two domains, which is grounded in the real differences in subject matters and in the relationship in which their sciences stand to them. Science is unified in the form that scientific knowledge takes, the reasoning by which it is produced and the concepts in terms of which its production can be adequately theorized or reconstructed. Bhaskar claims that the object of scientific activity is not the event or action in the hermeneutic tradition, nor the conjunctions in the positivist tradition, but structures and generative mechanisms. Activity is the medium in which structures are transformed and reproduced; thus activity does not produce or create them. Predicates that appear in the explanation of social phenomena will be different from those that appear in natural scientific explanations, but the principles that govern their production will remain substantially the same. Because social objects cannot be reduced to natural objects and so possess qualitatively different features, they cannot be studied in the same way. Yet they can still be studied scientifically. Bhaskar claims that both parties to the naturalist debate ignore this ontological gap between causal laws and their empirical grounds. This view of science where theories are explanatory and not predictive opens up a much wider field where methods can be applied to wider ranging topics. Researchers have been restricted to empirical levels in their research and this allows them more depth.

Hooker (1987) believes that it is our cognitive control structures that now dominate our behavioural abilities, not our instinct or genes.

Science is now transforming the social conditions of human life as is seen in genetic interventions and cloning. Hooker suggests that science may be an adaptive mechanism for coping with survival; thus it is relative to each given culture. Empiricists see the social institutionalization of science as being irrelevant to its cognitive organization and content. Hooker believes that we need a better conception of science, society and human policies, which includes normative considerations. It would appear that this chapter has gone full circle, where at the beginning it was shown how positivist knowledge came to be seen as belonging to science, which excluded all things normative as belonging to metaphysics. The inadequacies of this approach have plagued science and psychology though the century and it is for this reason that Hooker suggests that we need a better conception of science. Western cultures have traditionally seen norms and facts as separate entities. However, as Habermas (1971) claims, the adoption of certain interests to the exclusion of others is ultimately a question of values and not facts, a matter for decision and not demonstration. Hooker cites the empiricist exclusion of normative considerations as leading to the fact/ value dichotomy. The normative has, however, entered science through its objects of study. He claims that there are a number of values that guide the activities of scientists, such as: increasing access to explanatory depth, explanatory precision, predictive scope, predictive precision, heuristic power, simplicity, technical applicability and reliability, sociocultural control, interpersonal communicative range and a rich cultural structure. Hence Hooker refutes positivism's claim to be value neutral as does Habermas who cites positivism's commitment to technological rationality behind a facade of value-freedom (McCarthy, 1984).

The scientific realist attempts to describe reality through theories which are intended true descriptions. Realists claim that there is no independent access to reality and the truth conditions of a proposition are assessed according to their meaningfulness and the conditions under which they are true are distinct from the conditions under which they are known to be true. This is a radical approach to science which aims at discovery and understanding instead of prediction and control. The goals of science are on a par with other life goals and science can be pursued with any goal in mind. This conception sees

science no longer as a separate, abstract endeavour but something that can have a multiplicity of goals, hence opening up areas to global understanding instead of atomistic approaches.

Hooker is an advocate of the evolutionary naturalistic view which claims that we do not know in advance what the potential scope of human knowledge is. Instead it is learnt as people and theories are studied. This is in agreement with Vygotsky's tenet that things only reveal themselves in movement and scientists need to look toward not only the actual level of development a child is at, but also to look towards their potential level. This is reflected in his notion of the zone of proximal development (1978) which is " the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers,"(p. 86). The potential level involves social interaction on an interpsychologial level and cannot be conceptualizd in terms of the individual's ability and is also congruent with Piaget's genetic epistemology of the 1970s. It would seem to emphasize a process rather than product orientation, which has significant implications for methodology. Logical positivism's view of the truth as an independent entity which can be accessed depending on one's measurement skills and hypothetico-deductive methodology has favoured a product orientation. This has flowed on to the research industry which has likewise favoured the product orientation of confirmation or disconfirmation of hypotheses.

Naturalism is anti-anthropocentric and distances itself from the tendency humans have to project themselves onto all the world and value the world only in relation to their own kind. Evolutionary naturalist realism sees humans as part of the world which they come to know through their interactions with it. This leads to a unity between scientific and philosophic theory. Hooker states that the two are interdependent, interact and should mutually cohere: philosophy offers a general theory of the world and it should cohere with the more specific view offered by science. Logical empiricism was anthropocentric in declaring as meaningless all assertions which are not verifiable by us. Realists believe that there are things in the world

that are real, but that we do not know; this does not take from them their existence or meaning. Evolutionary naturalist realism is thus a much broader notion of science than anything that has gone before. It places humans as evolutionary entities in a wider world context as opposed to the atomistic appproaches of the empiricists. It also has implications for a whole range of activities that see humans as one of the species on earth as well as one which has a wider responsibility than just to itself. Hooker stresses that many of our capacities may be communal or species capacities rather than intrinsically individual capacities. This is congruent with Vygotsky's idea of functions first occurring on the social plane and then being taken up onto the psychological plane. Vygotsky believed that social relations among people developmentally underlay all higher functions and their relationships. Hooker believes that our concept of self and our notions of reality may be more tied to being part of a socializing species than independent intrinsic properties of individuals. These notions all contradict the popular westernized view of the individual as being paramount where development takes place within the person.

As was stated at the beginning of this chapter, any coherent account of science must take into account the biological, institutional and cultural context within which scientific activity occurs. This is in agreement with Vygoysky's belief in placing people and research in an historical, socio-cultural context. Modern science is a social institution which is heavily determined by its surrounding society. Hooker believes that institutions stand at the heart of what constitutes science and choice of methods is always a function of the available techniques of communication and argument and of existing institutional structures through which behaviour is moulded, and also a function of the ideals towards which society is moving.

According to Hooker (1987) traditional philosophy of science regards science as an abstract structure which is separate from any activity of the scientist qua human. A scientific realist view sees theories of science as being literal descriptions of the physical world, as saying what there is and how it behaves. Thus the scientist is placed at the centre of the scientific activity and his knowledge, values, principles and beliefs are seen as relevant to the scientific study undertaken

(Feyerabend, 1963; Kuhn, 1962). Neglecting this context in which scientific activity takes place, reflects an empiricist view, which sees the institutional body of science as being irrelevant to its organization and content. Hooker sees the history of science as being a human artifact, which is subject to interaction between experimental choices and empirical evaluations. He believes that a critical theory of science is possible which can evaluate the historically conditioned psychosocial relationships that make up science. Critical theory is however in its infancy. Hooker sees objectivity as residing in an attitudinal structure of scientists. Scientists do not need a hard fact/value distinction but can obtain objectivity by taking open, critical, communicative approaches and submitting to scientific claims social processes of criticism before they are accepted.

The realist view of science is one which holds attractions for scientists. Unfortunately in their methodology, many scientists often retreat back to behaviourist individualism and the tendency to identify or reduce objects of study to their empirical grounds (Bhaskar, 1979). Until researchers abandon or realize that their methodologies are still largely in the positivist tradition, they will be hamstrung in their research.

This chapter has set out to trace the background in which current scientific research has evolved. The influences on the present context appear to owe much to the positivist tradition. Yet, while the philosophy of positivism itself has long since been abandoned by professional philosophers of science, its methodologies and traditions remain. It has been shown how the positivist experimental methodologies have been found to be flawed and inappropriate when dealing with humans. The desire of hermeneutics to separate the social from the natural sciences in order to be able to deal more effectively and appropriately with their subject matter, as well as the focus on activity and meaning of the agents, has led to a solution being offered that separates the social from the natural sciences. This would necessitate a return to the situation near the turn of the century when Vygotsky noted the fragmentation and lack of synthesis that was occurring in research. An alternative is to break with the current paradigm completely, instead of being in it or on its fringes.

The realist view of science seems to offer that alternative. It is not one that separates the sciences into kinds, but against the flow of disintegration and contradiction that characterizes psychology, offers a unified framework for the various sciences. It is a view of science which can accommodate the natural and social sciences with their different subject matters, yet still allows them to be studied scientifically. In an evolutionary sense realism places humans in the larger context of the world in which they function. However, it gives due regard to their differences from animals and among themselves, by accommodating different methods and approaches.

2

Children and Research

It is one hundred years since the births of both Piaget and Vygotsky in 1896. It is appropriate on the anniversary of two of the most renowned developmental psychologists of the century, to take a look at the current state of developmental research with children. This chapter presents a contextual overview of current research with children, using some Vygotskian and Piagetian themes.

In the previous chapter it was noted how much of current research takes place with little regard for the wider context in which it occurs. This can be seen to be in good part an outcome of the logical positivist tradition of science which has dominated much of scientific research this century. According to Toulmin (1978) the fragmentation of psychology can be attributed to the still dominant neopositivist theory of the behavioural sciences that succeeded the old positivism of the 1930s and 1940s. The root issue remains the very conception of science, its methods, tasks and their limits. The focus of logical positivism on reducing propositions to atomistic facts in order that they can be verified has led to a narrow perspective that seeks to control and reduce variables, rather than a focus that acknowledges the historical, social and cultural influences on scientific practice.

In this chapter current research with children will be reviewed, with a specific focus on research being undertaken in the theory of mind area. The legacies of the logical positivist view of science will be uncovered in the cultural attitudes to childhood and the accompanying view of development. Piagetian and Vygotskian perspectives on development are explored, along with the interpretations and misinterpretations of Piagetian theory. Piagetian theory has been wrongfully dismissed on many accounts, not least because of its apparent focus on age as a criterion of development. Current research, however, is using age as a criterion in its attempts to find levels of competence in children at lower ages than has previously been demonstrated.

The relation between competence and performance is explored as well as the different experimental designs that occur as a result of the conceptualization of this relationship. Much research currently regards performance as being the result of causal hidden antecedent competencies. The logical connection between successful performance and successful attribution of a competence is argued for along with the fact that an unsuccessful performance is not necessarily a result of a faulty competence. This competence performance attribution is seen in the area of false belief tests, where researchers attempt to establish whether children understand misrepresentation. An understanding of misrepresentation is taken to be the equivalent to possession of a theory of mind. The reliance on the performance of the child in terms of linguistic responses is seen as indicating whether the child has mastered the ability to understand misrepresentations. Children are found to be unable to convey a successful performance of misrepresentation before the age of four. From the age of four onwards, they are seen to be able to understand different scenarios depicting misrepresentation. The false belief test appears to be a litmus test for a theory of mind, but the fact that successful performance on this test might not be indicative of successful competence is widely ignored by researchers. It is suggested that early competence be placed in a developmental perspective, and that it be seen as a precursor, and a domain-specific skill, that later leads to the establishment of a mature cognitive competence.

The notion of whether children have a theory of mind is heavily reliant on one's view of what theories are, and this in turn stems from one's particular view of science. It will be seen that the current use of the term theory still reflects the logical-empiricist view of science. Henry Wellman's *The Child's Theory of Mind* (1990) has been influential in this area, with his depiction of theories. Much debate has arisen as to whether children come to understand other people through a theory or alternative views such as Goldman's (1993) simulation account or Hobson's (1991) interpersonal relatedness account. The fact that many of the current notions of theory and the mind might be viewed in a socio-cultural and historical context escapes the attention of most researchers; that other cultures and other epochs might have alternative views is also dismissed. Most research has been done in the two to six year age range, with little interest in the broader lifespan

covering adolescents and adults. The possibility that some adults might, or might not, have a theory of mind is not challenged.

Reporting adults' interviews with children reveals how experiments with children still reflect a mechanistic model of humans and a continued commitment to nonsocial doctrines of childhood. The question of whether to consider children's reports as data will be examined. Chapman (1991) suggests that they be considered as attempts at justification and not introspective reports of children's own cognitive processes. The motivation of assessments with children is explored in terms of a broader context. Meacham (1991) encourages a critical look at the motivational contexts that lie behind assessments with children and how this affects the procedures and tools used. The fact that the mind is now the focus of attention is explored and it is seen not to be as a result of a resolution of the mind/body problem, but stemming from the possibility of using the structures found in a child's mind through the simulation of artificial intelligence programmes. The view that children are seen on a similar level to animals and computers will be considered at the end of the chapter. The subordination of children and nature is likewise raised in this debate. The fact that many preschool children are now looked after in child care institutions is an example of how new things become the norm, how things become dominated by adults and humankind with their programmes of intervention and control.

SECTION A: THE CONTEXT IN WHICH DEVELOPMENT OCCURS

2.1. The Cultural Context of Childhood

One's view of science determines one's view of childhood as a research topic and the methods one chooses to use. Likewise one's view of the child is determined by the cultural notions of childhood present in society. Kessen (1979) cites the dominant belief in the western world of the importance of the individual and of the self-contained child. The child is seen as an isolable entity who moves through their development as a self-contained and complete individual. The history and experience of a person is seen to be contained within their bordering skin (Kessen, 1993). Theories are based on the premise of individual development

and research is conducted within this perspective. The single child has become the unit of analysis and all features of childhood are seen to be located within the child. It is easier to study a child alone and this has become the accepted unit of analysis in child study. Methods for studying children have been driven by what the individual child can bring to the research laboratory. In 1979, Bronfenbrenner described developmental psychology as "the science of the strange behaviour of children, in strange situations with strange adults for the briefest possible periods of time" (p.19). This has similar overtones to Harré and Secord's comments on the mechanistic view of humans mentioned in the previous chapter. For Bronfenbrenner, Harré and Secord the social character of children is denied along with the social nature of psychological functions.

A cost of the logical positivist desire for universalism has been the psychological search for a stable trait (and the earlier detected the better), a trait which is held to define or delimit a person. Kessen (1993) uses the Intelligence Quotient as an example of the elevation of a number as the best single measure of humanity by which physicians, lawyers and scholars are chosen. Kessen calls the desire for a closed system a crime, where childwatchers force their observations, first, into general principles and then, into a system and, not infrequently, into a cult. Kessen claims that while there are regularities in human behaviour that, say, stop humans from falling in love with frogs, it is important that developmental psychology discard its desire for the one best system, theoretically or methodologically. Hatch (1995) claims that the above themes reflect positivistic notions of childhood as an objective, definable entity that researchers can come to know if they perfect their measuring tools and adequately control for intervening variables.

Bruner (1986) argues that cultural beliefs about young children are arbitrary and deeply rooted. He claims that there is an incorrect view of the young child as egocentric, who is seen to be incapable of taking others' perspectives and who must be brought to sociality through development and learning. There is a belief that this individualistic self that develops and is determined by the univeral nature of humans, is beyond culture. The outer public world finally becomes represented in the inner, private one through processes like identification and

internalization. The child's growing knowledge of the world is seen to be achieved principally through direct encounters with the world rather than mediated by vicarious encounters and negotiating with others.

Sampson (1987) describes the culturally prescribed developmental process as being "I before We". The socially constituted, self-contained individual fails to promote the levels of self-cohesion necessary for a collectivity to manage itself without centralized and firm external governance. Sampson claims that society creates a person who is fundamentally at war with society, which must then intervene in order to maintain the social order that its created person threatens. In merely reporting the empirical findings it discovers, and in treating then as though they were eternal truths of human existence, rather than sociohistorical constructions, psychology generates knowledge which helps sustain current practices and institutions. The prevailing view of childhood seems to conveniently fit the positivistic notions of experimentation. A focus on the interdependence of children and their support systems would be very difficult to study under closed laboratory situations.

Ratner (1991) claims that research with children attributes nonsocial characteristics and origins to psychological phenomena. This is similar to empiricism, which sees psychological phenomena as independent entities whose qualities are fixed and only vary quantitatively. Empiricist methodology precludes comprehending the child as being an integral part of a wider, dynamic and changing society. Society is dissolved into independent factors whose origin and character are assumed to be given, thus denying its sociohistorical character. However, science needs to dispel the illusion that psychology stems from nonsocial sources and shift the focus from psychology's long-time obsession with the individual to that of investigating the interdependence of people within socio-historical contexts.

Vygotsky (1987) urged the investigation of the historical child and not the eternal child. One of his main tenets was that psychological functions occur first on the social plane and are then taken onto the psychological plane. This was his general genetic law of cultural development, which reflected the Marxist tradition where the

individual response emerges from the collective life. Functions occur first between people as an interpsychological category and then within the child as an intrapsychological category. Human learning presupposes a system by which children grow into the intellectual life of those around them, and acquire a vicarious consciousness. The scaffolding provided by the mother is a type of consciousness loan as she is always on the growing edge of the child's competence. Vygotsky's views offer a contextual approach to the study of childhood which a positivistic view of science cannot accommodate. Such an approach does not allow a reduction of structures to atomistic facts, nor does it tolerate a focus on separate abilities to the exclusion of others. It insists on a psychological explanation that is regulated by socio-historical, not biological processes. Vygotsky spoke against a single-factor theory of development with a single explanatory principle. He saw such a view as serving the biological reductionism that was prevalent in the 1930s.

2.2. The Developmental Perspective in Current Research

Vygotsky placed the study of development at the core of all psychology. He believed that a body would only show itself in movement and that ignoring development would present an inadequate picture of the structures under investigation. Such a conception of psychology would preclude a closed systems approach in the laboratory because it could not accommodate this concept of dynamic movement. An open systems approach to inquiry would be appropriate, however, as Bhaskar (1979) has noted. Here causal laws have to be interpreted as historical tendencies and not regularities according to Humean law. The scientific realist view of science would accommodate this view with its acknowledgement that we do not know things in advance. Its emphasis on theory generating and discovery, as opposed to the verificationist and testing emphasis of much in the past, would find congruence with a developmental approach focussed on process rather than product. The focus would be on the generating mechanisms behind competencies as opposed to the performance or manifestation of them.

Chandler and Chapman (1991) describe the traditional task of developmental psychology as detailing the competencies that regularly differentiate persons of different ages and accounting for the timing of

the sequencing of such abilities. Vygotsky (1978)[1] believed that similar events occurring at different ages of the child is reflected in the child's consciousness in completely different ways and have entirely different meanings for different children. He criticized the Western use of IQ tests which tested only completed development on the grounds that one cannot assume that completed development fully specifies a trajectory for the future. Most research has focussed on the products of concept formation and not the process or the developmental course of that formation. Bronfenbrenner's (1977) open systems approach to development challenges the traditional quest for prediction of developmental outcomes and the search for the invariant trajectory of development. Developmental outcomes are impossible to predict on the basis of the initial conditions present in the system. The basis of this unpredictability and variance lies in the interdependence of the child and the environment. The developing child acts within a context and transforms the structure of that context (Rogoff and Wertsch, 1984). By contrast, a metascientific approach that can accommodate the evolutionary, dynamic, transformational nature of development can be found instead in scientific realism, in particular, Hooker's (1987) evolutionary, naturalistic realism described in chapter one.

Chapman and Chandler (1991) describe the current situation in developmental psychology as an embarrassment. Each new wave of research details more divergent claims about almost any milestone; children are said to be able to deduce or behave in intentional ways between five months to fifteen years of age, depending on whom one reads. Chapman and Chandler claim that there are no clear guidelines for deciding when various human competencies develop. They believe that Piagetian theory drove a wedge between generations of developmental students. Before the cognitive revolution of the early 1960s, a premature consensus existed about how quickly young people come to participate in psychological ways of being that are fundamentally adult-like; in other words, how quickly children become little adults. This tendency of 'adultopomorphism' was to be found in the writings of most of twentieth century experimental child

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[1] *Mind and Society* was first published in 1934 and again in 1978, when it was translated from the Russian. Most of Vygotsky's works were banned under Stalin and have only recently been circulated and translated into English; hence the two publication dates.

psychologists. It was aided by psychodynamic theorists, who helped adult patients reconstruct their childhood, driven by the misleading assumption that children were miniature adults. In the early decades of North American psychology there was little to suggest that the basic competencies of young children might be fundamentally different from that of more knowledgeable adult counterparts.

Piaget's legacy on education has been great, for he realized that children are constructive thinkers who will only learn what they are structurally ready to learn. This view has had a large influence on educational theory and practice. Flavell (1996) suggests that many of Piaget's contributions have become so much a part of the way we view cognitive development nowadays, that they are difficult to distinguish from the mainstream literature. Piaget's theory enlightened researchers about the fact that children were qualitatively different from adults in their basic competencies for processing and organizing experience. Developmental psychologists subsequently set about trying to prove how competencies of children differed from those of adults.

Rogoff (1993) claims that the work of Vygotsky, Gibson, Piaget and Dewey fit together and provide a basis for a sociocultural theory of development. They share an emphasis that has yet to be understood in mainstream developmental psychology. Vygotsky and Piaget share an emphasis on understanding human processes through studying development, an approach to scholarly inquiry that contrasts with the study of static forms of thought without concern for their transformation. Gibson and Vygotsky share a conception of thinking as process rather than acquisition and possession, while Dewey and Vygotsky set out to explain the question of the role of social interaction in cognitive development.

Chandler and Chapman cite a third perspective of the 1970s and 1980s which tried to demonstrate that children acquire various cognitive competencies at a significantly earlier age than had been thought possible. The common target was Piaget's theory, and the common assumption was that the assessment strategies on which his theory relied unwittingly incorporated various performance factors which were unrelated to the competencies presumably being tested. It appeared

that Piaget had underestimated children's true abilities. Dean and Youniss (1991) claim that American psychologists have redefined competence on Piagetian tasks in terms of performance criteria. Piaget's interest was however in the structure of actions and interactions with a subject-object relationship that was conceptualized as being reciprocal. He granted power to the person to construct meanings for objects, whereas American psychologists have granted the stimulus power to force reactions in the subject or person (Piaget and Inhelder, 1969). Dean and Youniss (1991) call for an attempt to recapture the original framework in which Piaget operated so that a new generation of researchers might be offered a view of issues that have disappeared through successive transformations of Piaget's original project (Gold, 1987).

Flavell (1962) anticipated some of the problems that would arise when Piaget's writings were brought into American psychology

> "(Piaget) sees problems we would not be likely to see, he attacks these problems with methods different from those we would espouse, and he often theorizes about his results in ways which seem esoteric and even incomprehensible to us. For better or worse, it seems to be true that anything like an adequate understanding of Piaget's system demands a certain reorientation and acclimatizing-a certain holding in abeyance of habitual ways of looking at things, at least until it all starts to come clear"(p. 16).

Flavell's fears were well founded as Piaget repeatedly clashed with American psychologists over concepts, methods and purposes. In contrast to the strict separation enforced by Anglo-American psychology between fact and theory, observation and interpretation, Piaget interspersed theory with justification and avoided quantitative data where possible. According to Burman (1996) Piaget's exploratory, individually oriented tool of research was turned into a standardized assessment package by Anglo-American psychologists. Many of Piaget's tasks have become diagnostic assessment devices. Burman claims that Piaget's method of studying the growth of knowledge has been taken to be a theory of child development.

Burman (1996) claims that Piaget's interest in the epidemiological status of children's beliefs has been turned into a model of concept

acquisition be Anglo-American psychologists. Lourenco and Machado (1996) claim that data that invalidate the age criteria in Piagetian protocols, do not inflict much serious conceptual damage, as Piaget's major focus was on transformations. Smith (1991) criticizes Piaget (1983), who despite denying that age is a criterion, frequently drew conclusions about children's ages in reviewing his own empirical work. Piaget's theoretical account supports the expectation that age is not a criterion of a child's stage of development, but his empirical accounts embody conclusions about relation of age to developmental level. Smith maintains that an alternative interpretation of Piaget's theory is needed, where age is an indicator and not a criterion of developmental level. There is a difference between criteria and indicators; a criterion is universally valid and formulates properties that must be present or absent, whereas an indicator can have exceptions as it depends on relative frequencies. Smith goes further by claiming that age is just one of many variables that get invoked. Social class, for example, is a variable that plays an equally important role, yet it rarely gets invoked.

This fixation on age as a criterion is illustrated by Ruffman, Olson and Astington (1991), who carried out a study on children's understanding of visual ambiguity. They used 108 subjects aged between three and six years to determine whether children begin to understand that ambiguous visual cues are an insufficient source of knowledge. Previous research has shown this to occur around six years of age (Taylor, 1988). Ruffman et al wanted to determine whether this development occurs around the age of four, when children begin to understand related tasks like the false belief task. They found almost no three year olds recognised that the other could identify the unambiguous pair, but not the ambiguous pair, but about half the four year olds and most five and six year olds could do so. They then concluded that an understanding of ambiguity develops around age four, and that there is one stage at which this occurs rather than two. This research is typical of current efforts and bears similarities to the false belief research, with the focus on the age at which performance seems to change, rather than focussing on the change and the mechanisms responsible for it.

Piaget was criticised for his alleged view of development as proceeding from absence to presence. However this is a misinterpretation for he

had a constructivist view which saw development as a progressive transformation, differentiation and integration. Ruffman et al's (1991) experiment could also be criticised on the grounds of not seeing visual ambiguity in terms of a process orientation. Piaget allowed for different stages in the epistemic process of knowing. Piaget's theory of intellectual development was a normative theory, in that it dealt with competencies that could be possessed with varying degrees of accomplishment (Wood and Power, 1987). Thus Piaget saw a difference between a successful display of an ability and a high ability, which most researchers tend to ignore. Piaget has also been criticized for neglecting the role of the social context in his formulations. However, he rejected social empiricism as reducing social factors to independent variables that accelerated or decelerated development and preferred to see social interactions as being embodied in the cognitive structures which were the real focus of his attention.

Case (1992) sees different directions in developmental research emerging from the early 1980s. The first is the neo-Piagetian one which retains Piaget's general-systems perspective, but introduces a stronger set of assumptions concerning the specificity of children's conceptual learning and its environmental dependence. A second direction was taken in response to some of Chomsky's assumptions that the mind is essentially modular. Within any of these modules there is a great deal of internal structure, some of which is present at birth. As they get older and come into contact with physical and cultural experience, children's pre-wired structures become re-worked into more sophisticated systems or theories (Carey, 1985; Karmiloff-Smith, 1989). It is interesting to note that Gopnik (1996), a proponent of the theory-theory view which is discussed later, subscribes to this modular approach. She asserts that social interaction cannot be a mechanism for cognitive change but could be an important condition in develpment. Pinker (1994) is another who proposes a modular account of semantic development. A third direction was taken by investigators who were in agreement with neo-innatist theorists in suggesting that cognitive structures are domain-specific (Chi, 1988).

All these trends in developmental psychology have occurred within a lifetime of a researcher; there are advocates of every kind of

perspective. The meaning of concepts is now frequently replaced by arguments about methodological procedures by those who claim to have discovered a lower bound of some competence and others defending the legitimacy of some higher or lower threshold of that same ability.

2.3. Competence and Performance

If the proper task of developmental psychology is the detailing of competencies that differentiate people of differing ages and the accounting for the timing of the sequencing of such abilities (Chandler & Chapman, 1991), then how does one test for the presence or absence of a competence? Cognitive competence has to be viewed in the context of the relevant task and sociocultural constraints. Chandler defines competence concepts as being normative and explanatory, not descriptive or empirical generalisations. They seek to elucidate the causes of actual concrete performances. He outlines different ways of seeing the competence performance relation: the first is a strict performance theory, which seeks an understanding between behaviour and the stimulus giving rise to it. The second is a straight competence theory which sees the aptitude for using a capacity as an integral part of the capacity itself. The third is the view that sees performance as being causally determined by competence, where the approach is hypothetico-deductive with the goal of developing an explanatory framework in which competence can be seen as the explanatory cause of which manifest behaviour is the effect (Olson, 1978). The fourth is the view that competence concepts explain performance where the method is abductive (Peirce, 1931). Here behaviour is seen to be a clue to the pattern or meaning that cuts across it (Fodor and Garnett, 1966).

Chandler rejects the first two out of hand as one cannot collapse the two concepts of performance and competence into each other. Models that reduce competence to the variables assumed to be responsible for producing observed patterns of behaviour are seen to be incorrect. Making real-life predictions about concrete behaviours, requires honing in on the measurement of competence. Chandler believes that there are too many possible candidates to be antecedent variables, where the absence of one must imply the absence of a successful performance. Thus one can never be certain whether failure on a given testing

procedure is because of the absence of a particular competence or because of a deficit in performance (Einhorn and Hogarth, 1981). The result is that faulty competence cannot be established from faulty performance and every causal theory that treats manifest behaviours as the effect of some competence veers towards solipsism. Another problem with trying to construe competence as a causal factor in performance, is the tendency to favour earlier and earlier attributions of competence. This occurs when behaviours that confirm the presence of an hypothesized ability are accepted and are read as direct manifestations of that competence, while those that fail to do so are dismissed on technical measurment grounds (Lopez, 1981). The age at which a given competency is ascribed moves inexorably downward as experimental evidence accumulates, while on certain occassions people choose not to display an ability that they undoubtedly have.

Chandler favours the fourth approach to the competence-performance relation, an approach which seeks not to predict what individuals will do next, but to utilise particular performances as clues to the existence of some structure that gives meaning to the specific actions in question (Fodor and Garnett, 1966). The methodological approach centers on sifting through behaviours to find a pattern of structures and transformational rules. This is an abductive approach which seeks to explain the underlying mechanisms of structures. Abduction is a process of reasoning to an explanation. The relationships are therefore ones of identification of presumed effects back to an underlying cause. Because the relations between competencies and their manifestations are not contingent, but matters of identification, the business of predicting one from the other is made incoherent. This suggests a method that is abductive rather than empirical-analytic, where behaviours are seen as clues to the patterns or meanings that cut across them (Fodor and Garnett, 1966).

Fischer, Bullock, Rotenberg and Raya (1993) expand the notion of competence as an emergent characteristic of a person in a context, and not of the person alone. Competence arises from the collaboration between the person and context, with competence changing when the context changes. Fischer et al claim that theories of competence have been fundamentally flawed by their focus on the organism and their

failure to recognise the contributions of the context to competence. They criticise the view that people's competence is described as a fixed capacity analagous to the amount of liquid that can be placed in a glass. This view holds that whatever context the child is in, the competence remains the same. Fischer et al suggest the notion of a skill as a starting point. A skill requires a collaboration between the person and the context. Skills therefore vary not only between people but also across contexts for one given person (Fischer and Farrar, 1988). Skill replaces the organismic definition of competence with the idea that capacities literally arise from the collaboration of a person with a context.

SECTION B: THEORY OF MIND RESEARCH

2. 4. Children and Chimpanzees

Theory of mind research was precipitated by Premack and Woodruff's (1978) speculations about the chimpanzee's understanding of mind. Woodruff and Premack were interested in whether chimps could predict what an actor would do next by observing the actor's efforts and inferring his or her underlying goal. A correct prediction would require the chimp to realize that the agent would not act in accordance with the state of the world, but rather in accordance with a mental representation of the world. Secondly, it would require the chimp to set aside its own representation of the world and take into account another's mistaken representation. If the chimp could grasp that an agent would act in accord with his own belief, even if that belief were false, it would clearly show that the chimp could make genuinely psychological predictions based on reading of the agent's mental state. Woodruff and Premack claimed that chimpanzees could impute mental states to others because Sarah, their subject, could choose the correct photograph from a selection that solved her problem; thus she could be said to have a theory of mind. This study has triggered a wave of testing on children's understanding of the mind.

It must be remembered that experiments were preferred with animals in the logical positivist tradition as it was easier to control all the variables and easier to administer the treatments in a laboratory. The preference for observing phenomena in animals to observing them in

children completely ignores the likely fact that children operate in a social world and acquire meaning in a completely different way from animals; it hints at a view of children as being on the same level as animals. Kessen (1996) claims that in the 1950s rats were more popular in developmental research than children. Van Der Veer and Valsiner (1994) describe this as the animilization of child psychology, when the response of a three year old is equated to the response of an ape. While speech is noted by all as present in the process of solution finding with humans, it is treated as a secondary factor and is equated to the arm length of the ape and regarded as a direct response to a stimulus. Van Der Veer and Valsiner believe that researchers fail to acknowledge that with speech the child acquires a fundamentally different attitude to the situation in which the solution of practical problems is carried out. From a psychological point of view, the child's practical actions represent a completely different structure. According to a scientific realist view of science, researchers should be concerned with the structures of our competencies and not the realization of them, as is the case with animal research. It appears that the dominant mode of research with children appears to be restricted to a superficial, empirical level.

2. 5. Representational Competence

According to Sigel et al (1993) a child understands the notion of representational competence when they understand the representational rule that any event, object or person can be represented in some symbolic form and still retain its original meaning. Thus a car still retains its identity whether represented by a word or a picture. Understanding that a picture and an object clearly differ, yet share a common meaning, reflects a knowledge of the representational rule. This forms the basis for representational competence. Theory of mind research involves looking at children's understanding of mental states. It refers to our ability to make sense of behaviour in terms of mental states. Researchers have invoked the related concepts of belief and desire as explanatory concepts in the understanding of intentional acts. Dennett (1978) proposed that to demonstrate a true awareness of a mental state, the subject would have to take into account another person's incorrect belief about a situation. Thus the false belief test was

suggested as being crucial because a prediction based on a person's true belief could be made by assessing the actual state of the world rather than the person's mental representation. A prediction based on a person's false belief is derived from the person's representation of the state of the world rather than what is actually true. This has resulted in volumes of research being done on the understanding of false belief in children, a task which is based on the notion of representational competence. Mastery of false belief tasks has been taken as evidence that children understand that people can represent the same object or event in different ways.

The initial test was that of Wimmer and Perner (1983) with Maxi and the chocolate. A child is told that Maxi thinks that the chocolate is in one place. Maxi then goes away. While he is away the chocolate gets moved to another place. The child is then asked by the investigator where he thinks Maxi will look - in the place where he last left it or in the place where the child knows it has been moved to. Apparently children under four years of age have great difficulty in understanding that Maxi will still go and look for the chocolate in the place he last saw it. They believe he will look for it in the place they know it to be. Children aged four and up seem to understand that Maxi will still look in the position he last saw the chocolate and that he has a false belief about where it is. Children are then asked what they know and what Maxi knows (Butterworth, 1991).

The focus of this test is conservation or representation; that is, whether the child understands that the meaning of an instance is retained, in spite of change in form or symbolic level. This representational competence is necessary to perform any psychological task beyond the level of sensorimotor functioning. Piaget (1962) defined representation as "characterized by the fact that it goes beyond the present, extending the field of adaptation both in space and time. In other words, it evokes what lies outside the immediate perceptual and active field" (p. 273) and further, " we use the word representation in two different senses. In its broad sense, representation is identical with thought, that is with all intelligence which is based on a system of concepts or mental schemas and not merely on perceptions and actions. In its narrow sense, representation is restricted to the mental memory image that is the

symbolic evocation of absent realities," (p. 67). Representations therefore involve the understanding of the principle of the transference of symbols and the understanding of the relationships among nonobservable events (Sigel,1991).

Chandler (1988) claims that false belief tests and other procedures, which are meant to test the child's ability to distinguish between seeing and not seeing, share the common feature of gerrymandering specific people into positions of relative ignorance by guaranteeing they were poorly placed to access the full information which was readily available to others better situated. This results in the child being at the wrong place or the right place at the wrong time. The only difference is whether space or time was manipulated to guarantee one being better informed than the other. In his view, privileged information and false belief tests measure the same thing. Chandler maintains that if mastering false belief tests are enough to demonstrate possession of a theory of mind, then the same should be said of two year olds who understand that more information is better than less. Mastering false belief tests does not signal an appreciation of many interpretations of reality. Rather, it shows that different realities support different interpretations. The ability to represent and entertain multiple representations does not necessaily mean that anything is maturing. It is possible that something might merely be becoming more complex. Chandler claims that for methodological rather than substantive reasons registering certain beliefs as false is less of a watershed than is claimed.

Mitchell (1994) sees young children's preoccupation with reality as being adaptive. He views this from an evolutionary perspective where development takes the form of smooth evolution rather than conceptual revolution. When young children are forced to make judgements about misrepresentations which have no basis in reality, Mitchell believes that they judge incorrectly because they consult reality. Reality is relevant for young children, because they have to master their physical environment in order to sustain an independent existence. Mitchell claims that misrepresentations and notions of false belief are not relevant tools for young children until they are projected more into the social realm. Chandler (1988) believes that preschoolers' beliefs have their origins in the external environment and their mental structures

correspond to those of reality. Doubts occur only if one is in the wrong place. Reality is known with absolute certainty. In middle childhood the ability to consider higher order beliefs develops, and this can cause specific doubts. Biases which confound knowledge, however, do not force the child to give up their realistic theory of mind for a more constructivist one. The child is convinced that if there are two different meanings to the same facts, one meaning is definitely mistaken. Likewise Samuels and Taylor (1992) have found that in nonemotional situations children do not have trouble distinguishing between reality and pretence, whereas, in emotional situations Taylor has found that children use their emotions as a cue to reality. These are two variables that have been competely ignored by researchers.

The false belief test also ignores the knowledge base of the self, the subject of the beliefs and desires who is situated in a historical context and who has beliefs and desires that are themselves part of history. The fact that representational competence is a product of socialization which is initially experienced within the family context is likewise ignored. Children engage with their parents and peers and encounter a variety of opportunities to become involved in language and the sharing of space and objects. The child's ability to represent an object which is absent or an event that is not perceived is the building block for the ability to misrepresent an object or event or to understand this misrepresentation. Dunn (1991) has noted the importance of family discourse in the development of children's understanding of others' psychological states. She has found that settings in which understandings of others' psychological states occur are rarely emotionally neutral. She postulates that the socioemotional capacities may contribute to reflection. Emotionally urgent situations that occur within the daily dramas of family interactions have rarely been studied. A child's understanding develops in a social context and will vary across different relationships for the same child. Dunn sees it as paradoxical that in the matter of children's understanding of their own and others' thoughts, desires and feelings, the role of social interaction has been little studied.

There appears to be a bias in trying to pinpoint at exactly which age the false-belief test can be mastered. Many researchers appear to be

quibbling over whether it begins at eighteen months, at which time Perner (1991) describes children as situation theorists, or as Wellman (1993) suggests, at two and a half years where children understand the hypothetical nature of mind but not its causal nature. The focus seems to be on age as a criterion and not on competency. The results of false belief tests show that three year olds are limited in their ability to reason about false belief, whereas by the age of five they have overcome most of the difficulties associated with this experimental task. Gopnik, Slaughter and Meltzoff (1994) describe the development of a theory of mind before the age of two and a half as being characterized by an egocentric, nonrepresentational understanding of perception which is seen in joint attention, social referencing and object permanence abilities. Gopnik et al claim that at two and a half years children clearly understand nonrepresentational states of perception and desire as they can solve simple desire tasks and manage perspective-taking tasks. At the age of three they show better understanding of the representational aspects of desire and also understand level one perception even when the question is phrased in terms of belief. At the age of four the accumulation of counter evidence leads the child to generalise the notion of misrepresentation from perceptual contexts and develop a widely applicable notion of false belief. It is obvious that the focus of the tests seem to be the age at which the performance succeeds.

It would seem, then, that theory of mind research illustrates Chandler's warning about taking performance as being causally determined by competence. The failure by three year olds to master false belief tests cannot confidently be said to be caused by an absence of competence or a deficit in performance. One cannot establish faulty competence from the faulty performance of the failure to understand the false belief situation. Chandler sees this as being an explanatory dodge which is meant to rescue the claims of so-called competency theories from the possibility of refutation (Sampson, 1981). Lourenco and Machado (1996) warn that correct performance may be explained by low level matching strategies and may not necessarily be the result of deductive reasoning, which theory of mind researchers claim is the case.

Despite claims to the contrary, Piaget did not argue for the evidence of an inability, for one cannot prove a negative, but rather for the absence of evidence of an inability. This point links up with the asymmetry between successful and unsuccessful performance predictions. When children's performance is assessed by the use of operational criteria and satisfies those criteria, the inference is that the child possesses a corresponding ability. When the child's performance does not satisfy the criteria, the inference to draw is more difficult. Successful performance warrants attribution of some ability, unsuccessful performance leaves open the question of which abilities a child has. Piaget saw development as a progressive differentiation of abilities and not a sudden presence from absence for which he has been criticised. An example of Piaget's (1926) progressive differentiation is demonstrated in his conservation tasks where with stage one (nonconservation), stage two (empirical conservation) and stage three (necessary conservation), he distinguished between three epistemic states. He did this in terms of his levels of concrete thought: preoperational, intermediate and operational thought. The intermediate ability of empirical conservation represented an advance on nonconservation because correct judgements can sometimes be given. It is not as advanced as stage three or necessary conservation, because incorrect judgements are still possible and the judgement is based on its truth value (true or false), rather than its modal status, (empirical or necessary). Modality presupposes truth value and so stage three thinking cannot precede stage two. This differentiation of abilities is not evident in much developmental research, nor in theory of mind research. As soon as children can master the false belief test they are claimed to have a theory of mind, which is not regarded as a precursor to a more mature, later developing theory of mind. The focus of the false belief tests does not appear to be of a developmental nature, with initial sightings of competencies that later consolidate and generalise across contexts into a differentiated competency or ability.

Carpendale and Chandler (1996) claim that the false belief understanding has been equated with the more demanding notion of interpretation. Most theorists believe that the only true difference between four year olds' and adults' understanding of the mind is qualitative and skill driven. Carpendale and Chandler oppose this 'one

miracle' view of epistemic development. They claim that interpretive understanding only begins around the ages of six, seven and eight. False belief tests are about matters of truth telling and relative ignorance and not about the interpretive nature of the knowing process.

The problem with the false belief test is that it focusses on representations, the material of thought, in the same way hermeneutics focusses on events or acts. According to Sigel (1991) a correct answer is an index of the child's conformity to adult standards and does not reveal the process of the child's thought. An incorrect answer is more ambiguous as it may reflect a lack of knowledge, a lack of understanding of the question or an instance of a child's logic. The focus is on a response to an event, not the generating mechanism behind it; it also assumes that the performance is causally related to some competence, along the lines of the regularity theory.

Campbell (1996) claims that mental representations are normally taken to be static structures in the mind. Correspondence with structures of elements outside the mind is what makes them mental representations: there, the commitment is to static structures and correspondence. Campbell claims that the correspondence notion is incoherent as the system would be required to know its own structure that does the representing, the structure in the environment that is being represented and the correspondence between them. He proposes the interactivist alternative which has an affinity with a dynamic systems conception. The commitment is to considering mental process and not structure. This process oriented conception of the mind is congruent with a scientific realist focus on generative mechanisms or generic causes that lie behind structures.

2. 6. The Older Child's Theory of Mind

Vygotsky (1978) postulated that it was only in adolescence that thinking in concepts occurs. Formations that are present before this are functionally equivalent to the true concepts that mature later, but their psychological nature, constituents, structure and mode of activity differ significantly from those of true concepts. He saw the development of

conceptual thinking as being a function of socio-cultural development, where tasks posed for the maturing adolescent by the social environment are an essential factor. If the environment does not pose the tasks, advance new demands, or stimulate the development of the intellect through new goals, the adolescent's thinking does not develop all its inherent potentialities. Two interesting notions would be to investigate the way different societies and cultures challenge their adolescents and to investigate whether different cultures have different theories of mind.

Piaget did not attribute children with a theory of mind until they were in the formal operational stage of adolescence. He described this stage as one of scientific thought which developed through the emergence of concepts like beliefs, desires, thoughts and fantasies, none of which emerged at an earlier stage. Before this he believed that there were planes within knowledge of action and conceptualization. Children do not think beyond actions; classification and conceptualization occur later (Briguier, 1980).

Fabricius and Schwanenflugel (1994) cite findings that suggest that older children are engaged in an extended process of developing a constructivist theory of mind. Mental activities can vary along a representational continuum. At the one end are activities that involve very little interpretation, organization and transformation of information. At the other end are those that involve extensive interpretation, organization and transformation. Fabricius and Schwanenflugel have found that eight year olds have a nonconstructivist theory of mind, where they categorize activities on the basis of seeing and hearing or outcomes, rather than mental processes. Six year olds have an information processing view, while ten year olds also categorize information on the basis of seeing and hearing rather than mental processes. Children of these ages also do not employ a constructivist theory of mind. It is only when children come to see that acquisition of information is influenced by mental processes that they are on the verge of a constructivist understanding of the mental processes. Young children do know that the same information can give rise to different outcomes. What changes is their understanding of how different outcomes are possible. Only around eleven years of age does

thought acquire a proper experimental orientation to answering questions regarding causal relations. A personal epistemology regarding the structure of the world only develops in late adolescence.

Chandler (1988) sees adolescence as the period in which a constructivist epistemology develops. Adolescents understand that interpretive differences that separate people are endemic to the knowing process itself. Doubts occur on a wide scale and question the trustworthiness of all knowledge. This can threaten the whole epistemic process and may leave no belief unturned. The shift from a realistic to a more constructivist epistemology introduces the notion of relativity of knowledge and the amibiguity of interpretation. Chandler regards this new theory of mind as the bridge between subjective experience and objective truth. A concern with this shift would open up a whole new area for theory of mind researchers who have previously only focussed on preschoolers.

Despite Deanna Kuhn's (1989) empiricist conception of science, she describes development as a continuum where at one end, the nondifferentiation of theory and evidence occurs. At this end she places young children and some adults. At the other end is the full differentiation and co-ordination of theory and evidence that is under conscious control. This is the domain of professional scientists. She sees the ability to co-ordinate theories and evidence as being dependent on a mastery of reasoning skills which develop with age, and she concludes that some adults never manage to get very far along the continuum.

There has been very little effort directed towards older children's understanding of mind, as the preoccupation is towards finding lower and lower threshholds of competence with younger and younger children. Research is needed to investigate how competence structures become generalized across different domains. In the following chapter narrative writing is suggested as a suitable methodology for research with adolescents.

SECTION C: ASSESSING CHILDREN'S KNOWLEDGE

2. 7. The Knowing Child

Much developmental research is aimed at assessing children's knowledge or understanding of objects, events or concepts. Because no one has direct access to the thoughts and meanings of others, the child has to rely on communication to find out what others think, know and believe, but also to share mental states and experiences with others (Brown and Dunn, 1991). Many researchers believe that they can tap into this understanding through eliciting verbal responses from children in answer to investigators' probes. This is based on a view of science which collapses all levels of epistemic states into one; it fails to appreciate that there might be different types of knowledge. The research also ignores the problems that exist for the child in communicating their knowledge or understanding to a stranger, often about situations which are outside of their everyday experience.

Vygotsky (1962) saw the distinction between different types of knowing as crucial in preschool children. He used the examples of learning one's mother tongue and a foreign language to draw the distinction. He took learning one's mother tongue as an example of spontaneous knowledge. This is knowledge that is neither conscious nor organized; one has it and uses it without being aware of doing so. It would seem to be equated to the lower biological functions. Learning a foreign language he equated with the concept of scientific knowledge, the acquisition of which is conscious, organized and voluntary. This he saw as developing once the child was at school, where it was founded on the basis of spontaneous knowledge. Again this appears to follow the development of a higher psychological function, which is dependent on it's biological substratum yet becomes realized and supercedes it through social relations. With this distinction between different types of knowledge in mind, it may be that theory of mind researchers are investigating young children who are still at the stage of Vygotsky's spontaneous knowledge. They lack awareness of this knowledge yet are able to use it correctly. While they lack conscious awareness and organization, they use the knowledge intuitively. If a child is asked to reflect on this knowledge, they might not be able to give a considered

response. Children's practical knowledge is well established before they are able to answer reflective questions on the topic (Dunn, 1991). Wertsch (1985) claims that asking children why they are doing things is like asking fish about water. First you need to explain what water is and remind the fish that it is there. What the fish then has to say about water may be interesting, but it has as much to do with your question and its setup as it does with the fish's experience with water.

Biggs (1992) distinguishes between different types of knowledge: 1) Tacit knowledge which is manifested by doing and is usually not verbally accessible; 2) Intuitive knowledge that is directly perceived or felt; 3) Declarative knowledge which is expressed through the medium of a symbol system which is publicly understandable; 4) Theoretical knowledge which is at a higher level of abstraction; 5) Metatheoretical knowledge which goes beyond the bounds of conventional theory to where paradigms may be shifted; 6) Procedural knowledge which refers to knowing how like tacit knowledge, but it is not necessarily unverbalized; and 7) Conditional knowledge which provides support for procedural knowledge: knowing how and why. Forms of knowledge from one to five are hierarchical, thus declarative knowledge has its roots in tacit and intuitive knowledge. The implications of this for developmental theory have been ignored, as is seen in the false belief tests, when children are asked what they know. Children are forced to focus on the logical and declarative, rather than the intuitive and procedural.

According to Bidell and Fischer (1992) most contemporary cognitive developmental theorists accept the principle of domain specificity. According to this theory, knowledge is not organised in unitary structures that cut across all types of tasks and situations. It is organized within specific domains defined by particular contents or tasks such as music or spatial properties. The recognition that knowledge does not have to be organized in single unitary structures is a first step in moving away from context neutral conceptions of cognition. However despite the recognition of domain specificity, cognitive abilities continue to be portrayed in ways that separate context specific performance from organismic cognitive structures. Cognitive structures are seen as the product of a developmental process

that is somehow independent of learning. Development is thought to supply the general structures of knowledge, while learning has the task of filling up these preformed structures with educational content. There is an artificial division of structure from content. A cognitive developmental theory should describe the ways that cognitive organisation is constructed in the context of everyday activity. This calls for a new conception of cognitive abilities, not as abstract structures, but as context-specific organisations of thought and action.

Bidell and Fischer recommend the skill theory, which describes the acquisition of knowledge in terms of the construction of specific, context embedded skills rather than the general equilibrium of cross-contextual logical structures. An individual's level of cognitive ability in a given task or situation is not rigidly determined by a pre-established logical system, but is highly flexible and differs according to the degree of social support afforded by a given context. The developmental range (Kitchener and Fischer, 1990) describes the range of developmental levels an individual can exhibit on a given task across a variety of contexts. Vygotsky (1978) drew attention to this phenomenon with his zone of proximal development. This referred to a range of levels of ability an individual could achieve under differing conditions of social support. Vygotsky saw development taking place with the support of the social environment; thus, when the support varies, the level of children's performance varies through a zone or range. Thus the level of a skill is context dependent. The developmental range thus provides a tool for examining how environmental support affects cognitive development. Skills are constructed in one context and have to be generalized through reconstruction to other contexts. Fischer and Bidell suggest that the course of cognitive development be construed as a web rather than a hierarchical ladder, as its variety of potential starting points and multiple developmental pathways leading to different outcomes, lend themselves to this description.

A crucial distinction needs to be made in theory of mind methodology between what a child knows and what they think. A broader approach is needed which allows one to assess all areas of the child's mental functioning. There will always be a surface manifestation of what seems to be going on in human activity and an alternative interpretation to

what something means (Vygotsky, 1987). There is an assumption that thought and speech are identical functions, and along similar lines to Chandler's competence-performance relation, it is assumed that what a child says (their performance) is a true indication of what they are thinking (their competence). Vygotsky divided language into thought and speech as two independent streams, with thought not immediately coinciding with verbal expression. He saw thought not as consisting of individual words, but being greater in extent and volume than these. The transition from thought to speech he saw as an extremely complex process that involved the partitioning of thought and its recreation in words. Thus a direct transition from thought to word was impossible. His unit of analysis was 'word meaning,' which presupposed social interaction and generalization on the grounds that understanding can only occur when one can relate one's experience to a specific class of experiences that are known to the other person. On this view, to understand what someone thought about something, one would have to grapple with the concept of word meaning. Merely looking to the child's speech would ignore the context in which the social interaction took place as well as the influence of the generalisation. According to Vygotsky the meaning of a word develops long after the word has acquired a stable referent, for it is constantly being redefined at different ages. If one wanted to understand a child's thinking or cognitive development, using a technique that relied solely on linguistic responses would be an inadequate measure according to Vygotsky. Consistent with Chandler's argument, then, one cannot predict the child's thought or stage of cognitive competence from their utterances or performances.

Valsiner (1992) describes the development of knowledge through internalisation and externalisation processes. Initially, social experiences are taken into the intrapsychological cognitive-affective system of the self and restructured according to the previous structure of that self. The transformational nature of the internalisation process guarantees its transformation into a novel form. The 'social others' participate in constructing a constraining framework that guides the internalisation process. This transformation invokes Vygotsky's (1978) zone of proximal development, which involves the child's gradual internalisation of interactions between two people, one an adult or an

accomplished peer. As the child becomes adult, they become able to control the structures individually without scaffolding or assistance from the older person. Thus, the zone gradually decreases or even disappears with age. On the other hand, the contrary notion of developmental range grows larger with age.

The externalisation of this internal knowledge is similar to the internalisation process in possessing a transformative as opposed to a passive nature. Externalization involves constructive transformation of the internalised psychological phemonena into the interpersonal domain. Thus empirical research on cognitive development that looks only at the outcomes of the externalisation process is unable to infer anything about the true underlying process. The study of the externalisation process itself, the ways in which the internal becomes transformed into the externally available product, may replace the impasse reached when inferring mental representations from the outcomes of externalisation. Rogoff (1993) uses the term 'participatory appropriation' for internalisation, as she feels that internalisation implies a separation between the person and the social context. She uses appropriation to refer to the change that results from a person's own participation in an activity. Meacham (1993) likewise talks of externalising cognition into the environment, a process which sees cognition as development within a framework of interpersonal relations rather than as an attribute located within the mind of individual people.

Karmiloff-Smith (1992) sees the linguistic system as being domain general and becoming domain specific and modularized over the course of learning. Linguistic representations that are built up in infancy and early childhood serve as a means of comprehending and producing the native tongue. They are not however available as data for metalinguistic comprehension as they are information in the mind, not yet knowledge to the mind. The knowledge that is embedded implicitly in linguistic procedures has to be re-represented before it can be treated as data and ultimately as metalinguistic reflection. In the developmental literature when children cannot report on some aspect of their cognition, it is often implied that the knowledge is absent. Karmiloff-Smith's modularity model postulates that knowledge is represented internally, but is still in a format that is inaccessible to verbal report.

Before the child can become a potential linguist, his or her representations have to undergo multiple levels of redescription. Thus Karmiloff-Smith's model proposes a process of knowledge development similar to Piaget's with more mature models developing at a later stage. Piaget's constuctivism holds that knowledge of the world emerges via a process of creative invention. It is not a product of discovering ideas in a rationalist sense, nor of learning in the empiricist sense, but of literally creation by infants as experience interacts with their biological predisposition. This creative invention is only constrained by the physical laws of the environment and the biological possibilities of the child (Brainerd, 1996).

It is interesting to trace Vygotsky's and Piaget's different views on the development of thought, as false belief tests seem to rest on the linguistic abilities of children at the age at which language ability is differentiating and expanding. Piaget saw the history of the child's thought as a gradual socialization of autistic characteristics that define the child's mind. Social thought lay at the end of the developmental process. Chapman (1991) claims that Piaget did not dispute that language was social from the beginning, but believed that language and thought became more social during the preschool years as children came better at being able to understand, represent and anticipate others' views. Piaget (1962b) viewed children's thinking as being egocentric, a transitional stage between autistic and rational thought which he nevertheless believed was social. He viewed egocentric speech as having no useful function in the child's behaviour and it was an expression of the child's dream and would disappear over time. Vygotsky refuted this claim, believing that the first forms of intellectual life are practical, reality-directed thinking. He described children's thinking as operating on what surrounded the child.

Vygotsky saw the first form of speech as being social, after which it differentiates into egocentric and communicative speech. Both of these latter are equally social, but with different functions. Inner speech, then, develops from the social with egocentric speech being the transition. Vygotsky believed that egocentric speech occurred when the child encountered difficulties in automatic activities and he viewed it as the attempt to make sense of the situation in words. This occurred with

older children in the form of soundless, inner speech. Piaget did not dwell on the development of inner speech as he believed that egocentric speech disappeared. Vygotsky maintained that egocentric speech is transformed into inner speech. His distinction between thought and speech allowed for the fact that, while a child might use egocentric speech, that does not mean that his or her thought is egocentric. It may instead function as a component of realistic thinking with the logic of goal directed action and thinking. The age around which these notions of egocentric speech seem to fall is similar to when the false belief test scenario is tested on children. It is difficult to know how this changing speech function may affect linguistic responses that a child gives.

Piaget (1954, 1973) believed that language was necessary although not sufficient for operational thinking, as without it operations would not be able to be regulated by interpersonal exchange and cooperation. Operations would remain actions without being integrated into systems of simultaneous transformations. Gal'perin's (1969) theory of the development of mental acts suggests that the phenomenon of egocentric speech and the interiorization of action are intimately connected, although Piaget considered them to be separate. Gal'perin believed that while actions may be represented in mental imagery, they remain dependent on their material context. They are only freed from this by an intermediate step of being represented in audible, self-directed speech. As this self-directed speech becomes internalized, these semiotically represented actions become fully interiorized.

While Vygotsky saw cognitive growth as developing from the social to the individual plane, and Piaget from the individual to the social, both placed a dialectical emphasis on the interaction between society and the individual. Both are constructivist in stressing that the action of the subject gives rise to knowledge. Piaget gives the subject primacy, whereas Vygotsky gives it to the social environment. Both regard language as the mediator of reality and the important instrument for self regulation of behaviour. They both seem to represent opposite poles in dialectical theories of the relationship between the individual and society. There cannot be knowledge in an individual unless, and until, that individual is in a sense social and unless that knowledge includes knowledge that is social (Butterworth and Light, 1982).

2. 8. Reporting Adults' Interviews with Children

It is extremely difficult to tell whether or not children are exercising an ability they possess. Likewise the reliance of the false belief tests on the child's linguistic responses to a hypothetical situation is problematic. The fact that a child might understand something, but might not have the competency to convey that understanding, is taken to mean that they do not have the cognitive ability. A linguistic response to an investigator's question is not an adequate measure for understanding a mental state. Human action is mediated by language and, because of this, it is subject to multiple interpretations. This then places a priority on the context in which the activity is occurring. Examining a child's verbal responses only accesses one area of understanding. From a Vygotskian perspective, this approach proceeds the wrong way round. It assumes that the verbal responses will reveal what it is that is hidden inside the mind, whereas according to Vygotsky, what is inside only has meaning in terms of the external context. Vygotsky did not accept the separation of mind and society.

Hatch (1995) describes children's interviews with adults as being speech events that end up having very closed rules with little true conversation. This points to the idea that the rules determine the game: a traditional laboratory-type situation immediately restricts a scenario to what variables a researcher is going to allow to occur and which responses he or she is looking for. Information presented is predetermined and is often used to try to elicit specific responses, or an either/or scenario. This is in line with the hypothetico-deductive method of doing research, which aims to confirm or refute a specific hypothesis. Experimenters are often only interested in a particular aspect of a subject's behaviour and so ask questions with this in mind as opposed to a general instruction of the subject to tell all. Subjects are frequently given a limited set of alternatives which need to be directly related to the representations that they have in mind. The hypothetico-deductive method is an extremely limited and restrictive approach to scientific discovery and understanding.

Behaviourists have traditionally been wary of treating verbal reports as data, although verbal responses have provided basic behavioural data in standard experimental designs. There has been uncertainty as how to treat the verbalizations of a subject as they find their way towards a solution or a response. These have been classified, along with the subject's responses to experimenter's questions, as being a part of the introspective process which most behaviourists reject as impossible to verify. Chapman (1991) claims that asking a child "How do you know?" implies a justification of a judgement and does not occasion an introspective report on its psychological antecedents. He argues that children's explanations of their own judgements on reasoning tasks should be considered as attempts at justification, not as introspective reports on their own cognitive processes. Their justifications are of theoretical interest in themselves, not just clues to processes by which their judgements were obtained. The relation between their justifications and their prior cognitive processes is an important theoretical and empirical problem, not an a priori given.

The children's reports are given in response to an experimenter's probe or question, and the influence of this probe on the child needs to be assessed. White (1988) argues that a question may mean different things to an experimenter and a subject, particularly when it involves a child. Subjects respond according to their interpretation and not that of the experimenter. While a child may use the same word as an experimenter, it is not clear that the meaning of this word is the same for the child as for the experimenter. The complexity of the false belief scenario should prompt researchers to be highly cautious when assessing the verbalisations of children. Their concept of the false belief test would require checking as to whether it was different from the experimenter, particularly as the misrepresented scenario is likely to be outside of their experience.

Nisbett and Wilson (1977) claim that the accuracy of subjective verbal reports is generally so poor as to suggest that any introspective access that may exist is not sufficient to produce generally reliable or correct reports. White (1980) claims that the relationship between introspective access and veral report accuracy is a cultural theory, based on a hypothetical entity called the self and the remainder of

mental activity. In this theory, consciousness is a faculty possessed by the self and which mediates between the self and the remainder of mental activity. White argues that propositions about consciousness carry no implications for verbal report accuracy and propositions about verbal report accuracy carry no implications for consciousness. He claims that any attempt to test a hypothesis about introspective access which uses verbal report content or accuracy as a dependent measure requires an assumption about the relationship betwen the two. If an assumption about this relationship cannot be validated, then there is little prospect for using verbal reports to test hypotheses about introspectice access. No one has ever succeeded in putting to the test any hypothesis about consciousness (White, 1980). McClure (1980) argues that Nisbett and Wilson base their approach on a positivistic conception of causes of behaviour in which the subject is depicted as a passive mediator. Traditional laboratory methods take no account of the active nature of the subject, nor of the causal structures that reside in the subject. They likewise fail to take into account all those processes that are internal to the subject, suggesting that the subject has no knowledge of what occurs between presentation of the stimulus and their response.

The giving of a verbal self report is a social act and to understand it we have to understand the subject's involvement in the social context in which it is given. People will aspire to accuracy in verbal reports only to the extent that it serves their practical concerns. There may be other practical considerations that may carry more weight than the need for accuracy. Excusing an action or gaining approval or power or avoiding attention may all be more important needs to the subject than accuracy. Children particularly may want to please the experimenter and give them what they figure the experimenter desires. Retrospective causal reports may be accurate, but high accuracy is not sufficient to infer that internally available information about events between the stimulus and the response was the reason for accuracy. Differences in conversational experience are reflected in differences in performance between older and younger children. Older children are better able to recognise the scientific purpose of an experimenter's question as they often know how to set aside quantity, quality and relevance rules in a conversation, and have more conversational scripts.

According to Ericsson and Simon (1980) retrospective reports are dependent on short term memory. If short term memory capacity is exceeded, information can be transferred to long term memory, but it may not be retrieved when the report is made. If the subject is asked for information immediately after performing the task, it is likely that most of the information will still be in short term memory which will allow direct reporting of the process and facilitate retrieval from long term memory for episodic associations. The operating characteristics of memory may have complex effects. For instance, the suffix effect hypothesis needs to be ruled out (Baddeley, 1976). A suffix impairs memory for most recent events, but leaves memory for earlier events intact. Any response to the process by the subject has the effect of a suffix. The consequence of this response is that memory for internal events immediately antecedent to it is destroyed. This hypothesis predicts inaccurate retrospective verbal reports until the suffix effect is ruled out. In false belief tests where young children are asked where they had first thought Maxi to be, effects of memory and retrieval may play a confounding role, as they frequently get this wrong.

Ericsson and Simon (1980) warn of instructions that require a visual scene to be described verbally, for requiring a verbal recoding of a picture requires extensive processing. This is likely to slow down processing, change the structure and course of the performance and may influence both what is remembered and what is later available to retrospective verbalization. The magnitude of the effects depends on how difficult it is to describe the visual scene in words. A number of studies have shown that different people show preferences for perceptual versus verbal processing. Requiring subjects to verbalize explanations in a task with complex visual stimuli would cause those with a preference for perceptual processing to alter their strategies and likewise their performance. The visual scenes that false belief tests encapsulate are reasonably complex as the child has to visualize two scenarios as well as make a prediction. When subjects are under a high cognitive load, it has been found that they stop verbalizing or do so incompletely. Furthermore information that has been stored in short term memory can be easily obliterated.

White (1980) suggests that the making of a judgement and the report should both be things that are easy for the subject to do. The task should not require concentration and effort by the subject when trying to comprehend difficult situations or instructions. False belief tests are extremely complex for they postulate hypothetical situations which are outside of the child's experience and then ask them to form a judgement. Manipulation in an experiment completely redefines the situation which has an unpredictable effect. Manipulation in the false belief tests can redefine the situation for the child without the experimenter being aware of it's effects. According to Donaldson (1978) a child's interpretation of what we say to them is influenced by their knowledge of the language, their assessment of what we intend, our nonlinguistic behaviour and the manner in which they represent the situation to themselves.

Ericsson and Simon (1980) however propose that verbal reports are data and accounting for them requires explication of the mechanisms by which they are generated and the ways in which they are sensitive to experimental factors. They caution that verbal reports need to be elicited with care and interpreted in the light of how they were obtained. They see the need for the development of a theory of the response mechanism, a theoretical framework that can provide a model for the verbalization process. At present the only common feature among different techniques to obtain data is that the subject reponds verbally to a question or instruction of the experimenter. The evidence that the subject has reached a solution is that they are able to report it. The relation of the report to the outcome of the process is never questioned.

The above-mentioned difficulties with verbal reports suggest that while they play a valuable role in getting information from the child, as in the case of theory of mind research, they should not be the sole or major source of information. They should be one of many sources of information as to how the child understands their own mental states and those of others.

2. 9. Children's Knowledge of Self and of Others

An area of particular interest in theory of mind research is the relation between the development of self knowledge and the development of knowledge about other people. The question is whether we experience our own psychological states directly and then use this information of our self to simulate the psychological experiences of others, or whether knowledge about the self has to be inferred the same way as knowledge about other people. The reason for describing different views on this subject is to reveal how one's view of science determines whether one accepts that children's understanding can be described as a theory. Morton's (1980) "theory-theory" holds that our knowledge of the mental world is a theory, where understanding of the self and others develop together as children acquire a theory of mind (Gopnik, 1993; Gopnik and Wellman,1992). Proponents of the theory-theory argue that children's knowledge of the mind is like an organised causal-explanatory system with the defining characteristics of theories; children's understanding of the mind is a coherent body of abstract theoretical constructs that are used to explain and predict behaviour. The theory-theory claims that the process that underlies the discovery of one's own psychological states does not differ from that which underlies the discovery of the psychological states of others; knowledge about the self and others develop in parallel. Limitations in understanding of other people's mental states will be reflected in the same limitations in understanding of one's own mental states.

Gopnik and Astington (1988) have supported this view by comparing research on young children's ability to report their own former false beliefs with their ability to answer questions about current false beliefs of other people. They claim further that if knowledge about one's own mental states has to be inferred rather than directly perceived, the chance of error occurring is far greater. On this view there is no reason to expect young children's reports about their own mental states to be accurate. Gopnik (1993) describes the alternative belief that people have direct reliable experience of their own psychological states as an illusion.

Wellman has been very influential in theory of mind research with his exposition of our understanding of mental states as theories. The view of theory that is commonly held in theory of mind research has been strongly influenced by Wellman's (1990) analysis. He classifies theory into two different types: everyday theory and scientific theory and further divides scientific theory into framework and specific theories. A framework theory is not dependent on empirical data and the formation and revision of such a theory does not require scientific theorizing. This type of theory defines the domains and processes within it. Specific theories advance the detailed explanations of phenomena within the domains of the framework theory. Specific theories are accountable to data, which in turn are dependent on global theories. Wellman suggests that a theory of mind be regarded as a framework theory, which defines the ontological domain and explanatory causal framework within which specific theories can be developed.

Wellman claims that young children's theories are acquired through everyday knowledge acquisition in childhood, and rely on the distinction between internal, mental states and external, physical and behavioural phenomena. Wellman proffers three criteria that a theory must meet. The first is that they are characterised by coherence. Theories are not a string of facts, but their meaning is enhanced through their interconnectedness in the structure. The second criterion is that they must display ontological distinctiveness, which is demonstrated through the separation of the world into two categories; the internal, mental realm and the external physical realm. The third criterion is that they provide us with explanatory causal frameworks with respect to the domain under investigation.

Wellman and Estes (1986) found that three year olds do not display a tendency to interpret mental entities as physical and real. Instead they found that children were clearly able to distinguish between mental and physical entities. They understood that mental entities represented a referent; a memory of a dog was not a dog, but was taken to represent it. Wellman claims that children consistently transform mental images, while understanding that they cannot be seen or touched in a way that real objects are. He claims that, although young children are not aware of their theories, they still use them. Their theories are not the products

of scientific theorizing as they do not test their theories by seeking confirming data. Wellman (1991) argues that, with their theory of mind, children are able to understand their own and others' mental states. This causal aspect of mind depicts human actions as the joint product of the actor's beliefs and desires. If children know the actor's beliefs and desires, they should be able to predict their behaviour. Likewise, if they are given an action to explain, they should be able to do so by appealing to beliefs and desires. Feldman (1992) describes Wellman's claim that three year olds have a theory of mind as having a positivist feeling, in that once it is acquired it allows the child to predict, just as in Skinnerian behaviourism. He believes that our knowledge of human intentions is more interpretive than predictive. It allows us to interpret what meaning an action may have and even to infer about others, states of mind that are not seen in action. It does not let us predict behaviours from mental states the way we predict animals will behave.

Astington and Gopnik (1991) claim that the theory formation view has been most productive in generating interesting empirical predictions and in explaining phenomena. They query whether it is at all possible to accelerate children's development at particular crucial times, for example, around the age of three to four. This reveals a view that ignores contextual influences on development. It belongs to the modular view which sees structures as being encased within the child and something that can be exposed through experimenter manipulation. It gives no credence to the child as an active mediator of those structures through use of their language and actions. The theory view also seems to place great store on the predictive value of theories as opposed to their explanatory worth. Astington and Gopnik claim that their view of theories provides explanation of phenomena, but it would seem to be more of a deductively derived than abductively generated explanation.

Simulation theory contradicts the position of the theory-theory. Goldman (1993) believes that psychological beliefs are not dependent on a theory of the mind. Rather, they are the consequence of having a particular type of mind - one which allows psychological experiences to occur. This view postulates that children directly experience their own mental states and use knowledge of their own minds as the basis for making inferences about the mental states of others (Harris,1991).

Children imagine themselves as being in the other person's situation and then take intentions and thoughts they would experience as corresponding to the actual psychological states of the other person. Wellman believes that the simulation and theory views are compatible in that children do have a wealth of observational-experiential data, but he claims that their understanding of that data can be theory-like. He claims that to understand these experiences children develop a framework by organizing their experiences so that they can simulate others' desires instead of having to cope with a stream of consciousness.

There is another view that children's understanding of the mind is not based on knowledge, but on a set of social and cultural practices and conventions - a form of life where the developmental mechanism is considered to be socialization (Butterworth, 1991). Butterworth (1994) likewise does not see the mind as a theoretical entity but something that can be directly perceived in behaviour. He states that children should not be regarded as folk psychologists but rather as people in a social world. Theorising is not the ultimate source of knowledge about the mind as information about mental events is available in social relationships. In real life minds are situated in bodies and mental events manifest in social behaviour.

Carl Johnson (1988) proposes that young children's understanding of the mind is not theory-like, but is the experience of the mind. He uses Vygotsky's distinction between young children and scholars. For children knowledge is initially intuitive and develops into something that is constructed. He claims that when young children are asked about mental phenomena, they answer by reporting from an organised structure of their own conscious experience, without the benefit of constructs or beliefs. They read off their own state of mind when they project themselves into another's position. This knowledge is therefore limited by their ability to imagine or simulate states of people in the world.

Hobson (1991) argues that children acquire knowledge of people with minds through experience of affectively charged interpersonal relations. This too is a Vygotskian notion. On this view children's understanding of people arises in a context of interpersonal relations. This understanding

is based on the innateness of our perceptions and involves relating to bodies of others with co-ordinated patterns of action and feeling. Hobson claims that mature experience presents itself as an immediate consciousness of the existence of things outside the mind. He sees the fact that people have minds as being no different from any other fact. Likewise, he questions why inference has to imply theorizing and asks precisely what aspects of mind are theoretically understood. He claims that we do not first perceive non-personal bodies and impute mental states at a relatively late stage; we do not infer that others have mental states. It is as true that persons have minds, as they have bodies, and the preconditions for coming to know this is the case include innate capacities for perceptually anchored personal relatedness. The structure of first person phenomenological experience provides a non-theoretical aspect to our awareness of the nature of mental life. Hobson maintains that because we infer things, this does not amount to theorizing. Our understanding of the mind is only partially theoretical in nature. He believes that it is only through the experience of personal relations that children can come to acquire a concept of persons with minds. Biologically determined biases and preconceptions are those that promote and reflect personal relatedness and it is through these that an infant establishes the basic ontological distinction between persons and things.

Hobson maintains that at no point in early development does anything like the use of a theory enter the picture. Children in their second year have a non-theorylike understanding of people with their own subjective orientations towards the world. To have and to apply a theory, one must already know what it is to theorize and so one must already have a concept of one's own theory-holding mind. Hobson maintains that awareness of other minds is a precondition for acquiring reflective self-awareness. To be able to adopt a psychological orientation to one's own mental states, one needs to appreciate alternative points of view. This is congruent with Vygotsky's notion of the primary role of the social context in psychological functioning. Children's understanding of the representational mind is acquired by way of earlier understanding that people have differing subjective orientations and attitudes to given objects and perceived events out there. Hobson criticizes Wellman for not differentiating between

knowledge and theory. Whilst both concepts provide underlying principles for conceptual organization, knowledge has to be true, whereas the same does not hold for a theory.

Hobson claims that the notion of theory leads us to underestimate the degree to which a child perceives and knows about other minds. He claims that we need public criteria according to which mental states can be judged. Research at present only uses language questioning with young children. He criticizes the possible treatment of mental states as being theoretically equal in nature, when there is great diversity in their nature and in the way they are understood. The theory of mind child theorist is portrayed as isolated and exclusively cognitivist creature. Hobson sees a problem with how the child knows the relation between others' representations and their actions, how the subjective aspects of mental life are linked to the outside world. The developmental progression is from an infant's perception and growing understanding of the public, psychologically expressive behaviour and attitudes of persons to a young child's more sophisticated knowledge of the nature of persons and their potentially, but only partially, undisclosed minds.

Hobson's differentiation of theory and knowledge calls to mind one's view of the nature of science. According to the logical positivist view, theory is a fixed knowledge structure with the role of organizing and ordering observations. The realist view is that theories are primarily explanatory tools which aim to understand the structures that lie behind and explain phenomena. They therefore have a role that lies beneath the empiricist surface level and have a scope that is often more global than positivist empiricism. Perner (1991) claims that knowledge is not an internal state, but denotes an internal state as that state relates to the external world. If one takes up the realist account of science, one needs to consider whether the theory that the child is deemed to have functions primarily as an explanatory tool. Wellman's view seems to be more that the theory is a tool for predicting behaviour from beliefs and desires than an explanatory tool. Thus his view has more of an empiricist ring to it, a view which is unacceptable to the realist view of science. Perner (1991) believes that to have a theory of something one has to have a deep explanation for how that something

works. Using mental terminology in causal statements is not enough for a set of beliefs to be called a theory of mind, for there is no explanation yet for how and why these mental states do their jobs. Dispositional explanations are of this nature, having little conceptual depth. Some realists would provisionally accept these explanations with the expectation that they be developed into more fully fledged explanations at a later stage. In the same way that there are different legitimate epistemic states of knowing, so are there different legitimate states of explanation.

SECTION D: MOTIVATION OF ASSESSMENTS WITH CHILDREN

Meacham (1991) believes that controversies surrounding the competencies of children will not be settled by looking at the techniques and tools of assessment nor at an idealized notion of competence. He believes that the controversy needs contextualizing through examining the situations in which it arises and the motivations of all parties. Whose interests are being served by the assessments and the interpretations given to children's competencies, as well as what type of assessment is involved, are all issues that need addressing. A crucial issue centres on what the type of assessment implies for the relationships between children and their teachers, parents, caregivers and public officials. Criteria for assessing children's competencies do not arise in a vacuum, but arise when someone wishes to take action toward children, and as a prerequisite, attempts to assess their abilities and then interpret those assessments. Meacham suggests that claims that such assessments objectively capture a child's competence and are thus a guide to future action, are an illusion. The results of the asessments are given meaning as a function of the context in which the need for them and desire for action arose. Burman (1996) warns how psychology's research methods can make psychologists complicit in constructing and maintaining hierarchies of power, inequality and oppressive practices.

2. 10. The Interest in The Mind

Kessen (1979) claims that the commitment of science to technology is tied in with traditional scientific notions of prediction and control. These are values that technology appears to require and to which empiricist science is able to contribute. Problems like antisocial behaviour, drug abuse and unemployment are scientifically related to childhood experiences. Solutions are suggested in terms of behavioural technological interventions, education programmes or therapies. The assumed primacy of expert over lay knowledge is found in descriptions of appropriate parenting styles for working mothers, parents experiencing divorce, and so on.

The technological milieu has been responsible for the credibility given to research on the mind. Perner (1991) suggestively comments that it is the possibility of being able to simulate the mind and its workings that has given credibility to research in this area. The resources that are being put into research programmes in artificial intelligence provide support for this claim. Once again the main aim seems to be the control and prediction of behaviour. Whilst explanatory forces are a consideration, they basically serve to enhance the main focus, which is prediction and control. The fact that researchers have approached the mind from the perspective of the child's own understanding, is based on the belief that more complex adult behaviours are an additive result of simple behaviours. The fact that the child's understanding and functioning might be entirely different from an adult's, seems to have been ignored, along with the associated views of Piagetian developmental psychology, The current view seems to be motivated by the belief that if one can understand the functioning of the child's mind, perhaps this simpler functioning might help in computer simulations of the adult mind. Once again the commitment to technological science with its emphasis on prediction and control is manifest.

The fact that mind is now an acceptable area for research has little to do with a resolution of the mind-body problem. Cognitive scientists have merely taken up the mind as a phenomenon to be studied, much as behaviourism took up behaviour. Some believe that the computational,

information-processing approach that dominates cognitive psychology will solve the nature of the relation between mind and body. The mind will have been shown to be a vastly complicated system of computational devices that are embodied in the brain. The relation of the mind to the brain will be of a computer programme driving a computer to the electronic hardware of the computer being driven. Schwartz (1980) describes the underlying proposals in cognitive theory as having the conviction that mental activity should be seen as a series of discrete, computational processes. There is a belief that formal systems describing such computations will provide us with the best and possibly only plausible psychological theories of human cognition. However, there is a marked difference between limited capacities and unbound competencies, and this difference has great psychological implications. Natural languages are infinite and so linguistic competence is unbounded, as are many of our other competencies. Harré and Gillett (1994) describe the illusion of cognitive science with its technical sophistication of the programming model that has not been matched by a coherent theory of the relation between formal computation and real life thought. Wiley (1994) describes the difference between the human brain and a computer as differences in their points of view. The human is in the first person and the computer is in the third; computers therefore lack intentionality and their knowledge is mechanical in nature. According to Wiley, they can therefore know nothing, for they cannot reason in the informal, implicit, contextual ways that humans can. Nor can they pay attention to any number of factors or reflect on themselves. Computers lack reflexivity from within as it is not a property of the materials themselves, but of the organization humans give to them. Dennett (1980) describes functionalist theories as being at the subpersonal level, where people are analyzed in terms of acquisitions of subsystems. The behaviour of the whole person is seen as an outcome of the interaction of those subsystems. As a result consciousness is ignored. He maintains that only those models that include consciousness will work.

2. 11. The Normal and the Natural

Whether we conceive of some developmental event as natural is for the most part a reflection of its normality within the socio-historical context. Assessment of children's abilities occur within a context of what is normal, but also in an often implicit context of what is thought to be natural in the course of development. The fact that early childhood care in institutionalized settings is becoming natural for most families is an example of how natural things are made normal. It is apparently natural for infants to desire the company of others and to need socialization from a very early age, such desires and needs being based on the normal custom that is now occurring in western societies to send children to be cared for in early childhood institutions. Whether they are natural or normal for the children, they are definitely advantageous for parents who wish to play a role that is valued in our society. Society devalues parenting as it creates a conflict between being a respectable solvent citizen and a good parent. According to Leach (1994) social institutions tend to isolate and not integrate public and personal aspects of life. With an overall social ethos of individualism and competition, this alienation impacts on families and their children. Leach claims that once social status and self image are not merely associated with, but built through, the accumulation of wealth itself, personal and pecuniary motives for work become inextricably entangled and unpaid activities degraded.

Society insists that parents must care for their children while competing in the market place with those who do not have children. Post industrial western society expects parents to be responsible for their children's care and long term upbringing, without any viable social support. It is considered normal for children to spend most of their waking hours with people whose paid job it is to care for them. If one gives more time and effort to children, it might make one a better parent, but it will also make one less of a solvent citizen. Institutional daycare offers advantages to parents that have little to do with infants' safety or needs. In middle childhood many parents hand their children over to schools, assuming that they are the ideal focus for children's lives. Recognizing the prime social value of parenting and making space for it among other adult roles is not enough. It is plausible to suggest that

parents should not have rights over their children, but rights to society's help and support in parenting them.

Meacham (1991) likens the domination of humans over nature, while still standing apart from it as similar to the domination of adults over children, while ignoring the interdependence of children and their parents within the same developmental course. Assessments of children's competencies are done from the standpoint that children are deficient and need intervention, manipulation and control. The objectives are to assess children early on so that there is a foundation of basic abilities on which intervention can be built and then to assess at a later stage the gains that have been made by the interventions. Kessen (1979) links this interventionist notion to a theme that has influenced child study this century - the ethic of personal responsibility. This has been brought about by the scientific need to identify causes and has led to a focus on someone assuming responsibility. Newman and Holzman (1993) see the dominance of causality and its role as an explanatory principle and topic to be investigated as permeating psychology. They see it as having a distorting and pernicious place in developmental psychology. This is based on the regularity view of causation, with its predictive value as opposed to a scientific realist's notion of causality as having a generative or productive nature.

Meacham suggets the appropriateness of another context which focusses instead on the relationship between children and their parents or teachers, instead of positive or negative evaluations based on the parent or child. This suggestion has Vygotskian overtones to it, for it is the developmental course within which both are participants that is being assessed. There is little interest in intervention, because there is a recognition that humans are dependent on a healthy, natural environment and that the psychological development of parents depends on the proper development of their children. Parent and child life courses are not separate, as assumed with the image of domination of children; they are shared. Any crime against children escalates into a crime against the family and community. An example is provided when assessing the competence of a child to testify in a court. This competence is located within the system of relationships that include the child, the parents and their attitudes to compliance, lying and the

legal system. It includes the procedures that are adopted by legal representatives in preparing for and during testimony of a child. Assessment of competence to testify, as might be ordered by a judge, is not an assessment of something that inheres within the child, but is an assessment of the whole system of relationships. If there is a lack of competence to testify, then the lack is not the child's alone, but a lack in the system of potential relationships within which the child is embedded. This has implications for facilitating the child's competence, by directing actions not only to the child, but also the parents and the community.

The traditional research focus on the child as an independent, isolated entity fails in its nonsocial attitude to the child and in the nonsocial experimental methods, which it seeks to impose on the child through its laboratory research paradigms. The restricted nature of the hypothetico-deductive model of inquiry is highlighted when it is contrasted to the scientific realist approach of theory generation and discovery. The methodologies of this alternative will be described in the next chapter where the research focus will be on the structures that lie behind the representational competencies and not the representations themselves.

3

A Methodological Perspective on Developmental Psychology

In conversation with Jean Briguier, Piaget recommended three strategies that would help foster creativity in research: 1) Read nothing in the field; read the literature in the field only afterwards; 2) Read as much as possible in related fields; 3) Have a whipping boy, like logical-positivism (1980, p. 127). These ideas are pertinent to scientists who are currently doing research. The hypothetico-deductive approach in methodology has long been the dominant paradigm with much new research in this tradition continuing in the hypothesis testing vein. Ignoring the literature comprising these studies in accordance with Piaget's advice is constructive if one sees the need to break with the paradigm. The norms that are set by the hypothetico-deductive method readily make for bland, uncritical research. The fact that much hypothetico-deductive testing does little to further the growth of scientific knowledge seems irrelevant to many; what matters is that something has been produced.

Piaget's recommendation to acquaint oneself with interdisciplinary fields is sound advice. The current trend appears to be towards more and more specialization. Experts in specialized fields are rewarded as their expertise continues to grow narrower. Generalists are increasingly becoming a feature of the past as is the importance of addressing the wider context in which one operates. The unfortunate consequence of having an extremely limited field of expertise is the restricted lifespan that much specialized knowledge seems to have. Those who have been trained with a broader perspective would be more adaptable to a changing reality. Even in medicine, the *Guidelines for Guidelines* (1996) warns against guidelines that are developed by experts or organisations with a narrow interest in a specific clinical problem. They may be completely inappropriate in more general settings.

Piaget's suggestion of having a whipping boy is more of a standard against which one can offer alternatives. Logical positivism and the

hypothetico-deductive method, lend themselves to being whipping boys as their version of science has been shown to be a restricted and unsustainable one. Gergen (1979) claims that if theories are not derived from, nor dependent on, observations, as in logical empiricist science, the theorist is then fundamentally free to engage in new theoretical departures. Likewise, Thagard's (1992) categorisation of discovery allows not only for discovery that is data driven, but also for discovery that is explanation and coherence driven.To the extent that Thagard is correct, this opens up the field to the possibility of new methodologies.

This chapter considers a number of methodologies of relevance to psychology, namely the grounded theory approach of Glaser and Strauss (1967) as well as Haig's abductive account of scientific method (1987, 1995), which itself provides a reconstruction of grounded theory. Grounded theory's formation as a comprehensive alternative to theory testing methodologies has been recast by Haig by placing it in a scientific realist framework. His abductive account of method which identifies problem solving, discovery and explanation as central features in a methodology is similarly based on a commitment to scientific realism. McGuire's contextualist approach (1983) emphasizes the contextual sensitivity of psychological research. In addition, the microgenetic method is suggested as a suitable approach to research with young children. It seeks to establish the processes that produce change over time; hence it has a developmental focus. This is achieved with a high density of observations over time as well as the use of verbal reports. Narrative writing is suggested as more appropriate to middle childhood and adolescence, with its emphasis on the development of communicative understanding. Assisted autobiography is presented as being appropriate for use with adults. It is not a record, but an interpretation of happenings and responses in someone's life, with the assistance of a team of experts. Different ages and different problems need different methods if they are to be sensitive tools in identifying relevant underlying mechanisms that explain phenomena.

3. 1. THE CONTEXTUALIST APPROACH

Contexts are not stable and permanent forms of reality, but rather constitute a reality that is developmental and transformative, in line with the scientific realist view of science. McGuire (1983) sees the current emphasis of empirical confrontation of theory and evidence as something that should not be a test of whether a theory is right or not, but a discovery process where the meaning of a hypothesis is made clear by disclosing its hidden assumptions and clarifying the circumstances under which it is true and those where it is false. McGuire contends that each hypothesis is true in a few appropriate contexts, yet dangerously false in others. This is reinforced by recent work in the philosophy of science by Cartwright (1983) who argues that "the laws of physics lie."

Contextualists see the first phase of initial hypothesis generation as being followed by a second empirical confrontation phase that continues and does not reverse the discovery process. Empirical confrontation of theory is a continuing revelation of its full meaning with its pattern of confirmation and disconfirmation in a set of different situations. Wide ranging contrasting theories can be valid in certain contexts, hence one should not test for the truth but the discovery of patterns in contexts. Adequate understanding of a phenomenon according to contextualists, require that it be investigated through a programme of research that is planned to reveal a wide range of circumstances that affect the phenomenon. There are innumerable theoretical representations for any situation, depending on the context. An integrated stylistic aspect to research is therefore needed.

McGuire dismisses the convergent unilinear style as used in attitude change research of the 40's and 50's. He likewise dismisses the divergent unilinear style which stresses the independent variable over the dependent variable. He favours a systems style of research where knowledge representations are allowed to reflect the complexities of real world situations which are being represented, allowing for the study of a complex set of variables. Some are seen as

independent, others as mediating, some as dependent, while all can covary naturally. This allows for the detection of multiple causal pathways whose contribution to covariance can fluctuate from one context to another.

McGuire criticizes the quality of mainstream social psychological research where an isolated study is planned and conducted and the outcome is reported in accordance with the preferred theory, the programme is then dropped and a study designed to confirm a new derivation from the theory. Adequate understanding of both theory and phenomena require them to be investigated through a programme of research that is planned to reveal a wide range of circumstances that affect the phenomena and a set of implicit assumptions that limit the theory. The contexts in which one or another relation obtains has to be made explicit. He sees the need for a programme of empirical research that will reveal the patterns of empirical contexts in which alternative conceptualizations manifest themselves. The three dimensions to research in McGuire's programme entail: 1) Manifestation of the phenomenon; 2) Methods that can be used; and 3) Types of explanations that can be theorized. Empirical confrontation needs to be treated as a continuing discovery process, with recognition being given to the existence and use of a wide range of formulations that can generate insight. It is advantageous that these contextualist priorities are incorporated into an abductive methodology congruent with a scientific realist view of science which sees theories as being primarily explanatory rather than predictive. Contextualism also encourages a more wholistic approach towards contexts and does not restrict researchers to empirical levels.

3. 2. GROUNDED THEORY

Glaser and Strauss (1967) developed a grounded theory approach to methodology in response to the overemphasis on theory verification that was and still is current. Grounded theory calls for the abandonment of random assignment of subjects to treatments, the use of large numbers of participants and the de-emphasis of hypothesis testing, experimental control and statistical testing. The emphasis

should rather be on theory generation through the inductive examination of information gleaned from data. The goal is to construct theories so as to understand phenomena. Rennie, Phillips and Quartaro (1988) used grounded theory in their psychotherapy process research. They were attracted to it because it offered an opportunity to create theory in a subject area that has been traditionally difficult to access with traditional hypothetico-deductive methods. They regard it as a useful strategy that can be broadly applied within psychology. Glaser and Strauss' grounded theory methodology is described below along with comments by Rennie et al.

3. 2. 1. The Constant Comparative Method

Glaser and Strauss advocate the use of the constant comparative method, which entails the systematic categorization of data, with theorizing only occurring after patterns in the data begin to emerge from the categorizing operation. This requires the data to be collected, categorized and memoed, moving towards parsimony through the determination of a core category, recycling of earlier steps, sorting of memos and then finally the writing up of the theory.

3. 2. 2. Data Collection

Initially the researcher focusses on what is central to the phenomenon. Participants are selected who seem to represent the phenomenon; this is done to maximize the chances of the phenomenon occurring. The selection of data sources needs one or more comparison groups. Glaser and Strauss refer to this as theoretical sampling. Groups can be compared even on the basis of a single dimension if it is judged to be pertinent to the emerging theory. As the number of comparison groups increases, the conditions and limits of the theory unfold.

3. 2. 3. Categorization

The choice of an analytic unit is arbitrary, but should be consistently used. Rennie et al (1988) used meaning units of individual concepts as their analytic unit. They recommend that the category generation initially be descriptive, so that the name of the category closely

reflects the language used by respondents. Each unit is assigned to as many categories as possible. If no categories fit a given unit, a new category is developed to represent it. Categories are descriptive as well as constructed and relationships between categories are developed. As the analysis proceeds, it becomes clear that some categories are the defining characteristics of properties of other categories. The categories begin to saturate, where the addition of further protocols reveal no further categories or relationships among them. Achieving the saturation of categories is an extremely labour intensive exercise.

3. 2. 4. Memoing

As the data are collected and analysed, ideas occur throughout the process. These ideas get recorded in the form of memos by the researcher. They help give insight into guiding assumptions. They raise the conceptual awareness of the researcher to think beyond single occurrences to themes and patterns in the data. They preserve premature ideas about categories or relationships that might be used at a later stage. They also record similarities between the emerging theory and existing theories.

3. 2. 5. The Movement Toward Parsimony

After saturation has occurred, the focus shifts towards relationships among the categories. Some are seen to be central, as they have links with many others. It becomes apparent that there is a network of categories that form a hierarchical structure where central categories subsume lower-order ones. Categories that have few connections with the emerging structure are dropped or collapsed into other categories. Effort is directed towards finding the most central category.

3. 2. 6. Writing the Theory

The main repository is the researcher's memo. It is here that ideas about potential categories and their relationships are noted. This conceptual material is the basis of the grounded theory. Memos are sorted, with new ones being created contributing to the generation of

a central category. It provides the organizational structure for the write up of the theory.

In principle anything can be addressed and widening the scope of research can be quite broad. The absence of external criteria makes it impossible to validate the truth value of individual verbal reports. However, the constant comparative method demonstrates that different individuals do say the same thing, hence giving credibility to individual accounts. Grounded theorists seek intimacy with the phenomena rather than external criteria of adequacy that verify theory. The object is to create new theory that is directed at the reality of individuals. The object is not to verify the theory; this is deliberately left to subsequent studies.The problem of limited generalizability is not resolved but accepted as the price to pay for research that is closely tied to the phenomenon it addresses. Grounded theory accesses areas of human experience that traditional methods find impossible to address.

3. 3. AN ABDUCTIVE ACCOUNT OF METHOD

Glaser and Strauss (1967) have argued for the inductive discovery of theory which is grounded in systematically analyzed data. Haig (1987,1995) offers a reconstruction of the grounded theory perspective on social science inquiry. He takes the view that grounded theory is best regarded as a general theory of scientific method, which is concerned with the detection and explanation of social phenomena. He proposes to reconstruct it as a problem-solving endeavour where theories are abductively generated from robust data patterns, elaborated through the construction of plausible models and justified in terms of their explanatory coherence. Haig believes that grounded theory can be strengthened by reconstructing it in accordance with recent developments in scientific realist methodology. He terms this account the abductive account of method. It suggests that the theory of scientific method is centrally concerned with generating theories abductively and appraising them in terms of what philosophers have come to call inference to the best explanation (Harman, 1968). Inference refers to the movement of thought within a sphere of belief and its function is to accept or reject propositions on the basis of

purported evidence. The best explanation is not a judgement of truth, as we do not have independent access to this, but it is a summary judgement of accessible explanatory virtues.

Josephson et al (1994) describe abduction as occurring when a doctor has to come up with a best explanation for symptoms. The diagnostic conclusion should explain the symptoms; it should be plausible and be significantly better than any alternative explanation. Abduction is concerned with explaining underlying mechanisms and is a fallible inference aimed at the production of truth. Deduction within the hypothetico-deductive method is truth preserving with the aim of conveying conclusive evidence. It is apparent that these two types of inference are based on different views of science. Abduction is based on a scientific realist view which sees knowledge as being fallible, where the truth is not given and known beforehand, but arises in our pursuit of it. Objects of our knowledge exist and act independently of the knowledge of which they are objects, so the knowledge we possess always consists in historically specific social forms. Abductive inferences are knowledge producing inferences despite their fallibility. They invoke a process of reasoning from an effect to a cause, of reasoning to an explanation. For the realist, the objects of scientific inquiry are not empirically given, but are real structures to be theorized about (Bhaskar, 1979). Deduction is based on a logical empiricist view, which holds that truth is given and we can come to know it if we perfect our measuring tools. The focus of Glaser and Strauss is on inductive inference, which sees the content of its theory coming from the data itself. Abductive inference sees theory as being generated from data patterns, but being about the cause of these patterns.

3. 3. 1. Problem Formulation

Central to the abductive account of scientific method is the selection and formulation of problems. Haig suggests the constraint-composition theory (Nickles, 1981) as an appropriate account of problems. This asserts that a problem comprises all the constraints on its own solution, along with the demand that the solution be found. The constraints are therefore part of the problem, they characterize and

give the problem its structure. In describing the problem we are literally halfway to solving it. Haig sugests that Glaser and Strauss regard problems and method as separate parts of an inquiry. Strauss asserts that method comes before the problem in the false belief that science has a natural beginning and ending. Haig believes that research begins wherever it is appropriate for researchers to enter it. Likewise, Haig criticizes Glaser and Strauss for their conception of problems as being a temporal phase that are dealt with by the researcher, who then moves on to another phase. Haig's abductive explanatory inferentialism sees researchers dealing with problems all the time. Problems are generated, selected, developed and modified. They regulate our thinking in the context of theory generation, development and appraisal.

3. 3. 2. Phenomena Detection

Haig likens grounded theory to the hypothetico-deductive method, in that while they offer different accounts of inquiry, they share the view that scientific theories explain and predict facts about observed data. They do not draw a distinction between data and phenomena. Theories however are constructed to explain phenomena and not data. Grounded theory should be grounded in phenomena and not data. Haig draws the distinction between phenomena as being relatively stable recurrent general features, whereas data are idiosyncratic to particular contexts. Data serve as evidence for phenomena and tend to be observable, whereas phenomena are not. Data are collected and analyzed with the aim of extracting robust data patterns or phenomena from the data (Woodward, 1989). Haig suggests that before theories are generated, grounded theorists need to first reliably establish phenomena. Concerning the construction of theory, he distinguishes between the different types of abduction: 1) Existential abduction which often occurs in theory generation; 2) Analogical abduction which frequently plays a role in theory development; and 3) Abduction as inference to the best explanation, which is centrally involved in theory appraisal.

3. 3. 3. Theory Generation

Haig suggests that Strauss' characterization of scientific method invokes the inductive generation of theory followed by deduction and verification. However with Peirce, he suggests that the creative inference involved in theory generation is existential abduction. This involves reasoning back from puzzling phenomena in order to generate explanations of the causes underlying phenomena. Abductive inference suggests that certain phenomena are encountered which are surprising as they do not follow on from any accepted hypothesis. These phenomena would follow as a matter of course from a new hypothesis and so the researcher concludes that the new hypothesis is plausible and needs to be investigated. Existential abduction cites indirect causal mechanisms without being able to provide specific detail about these mechanisms.

3. 3. 4. Theory Development

Haig believes that many psychological theories are seriously underdeveloped and suffer from being tested prematurely. The type of abduction involved in theory development is analogical. While we do not have knowledge of the causal mechanisms that are being probed abductively, we are entitled to construct models of those mechanisms by imagining something analagous to the mechanisms whose nature we do know. Harré (1976, 1978) sees this creative task as contributing to a more informed characterisation of a theory's causal mechanisms. An analogue of the primitively understood causal mechanism is developed by drawing on an appropriate source, which is usually familiar and understood.

3. 3. 5. Theory Appraisal

The hypothetico-deductive method of theory appraisal is used when theories are tested for empirical adequacy by finding out whether their test predictions have been borne out by the relevant data. Haig maintains that proper theory appraisal has to include evaluative dimensions as well as empirical adequacy. Scientific inquiry pursues multiple goals, which demands that a theory meet criteria other than

that of empirical adequacy. Other criteria include consilience, explanatory depth and simplicity. The type of abduction involved in mature theory appraisal is inference to the best explanation. This approach is consistent with the scientific realist view, where a theory is accepted when it is judged to provide a better explanation of the evidence than its rivals. Thagard's (1989, 1992) account of theory evaluation takes inference to the best explanation as being centrally concerned with establishing explanatory coherence. This is where propositions hold together because of their explanatory relations which are established through the operation of the principles of: symmetry, explanation, analogy, data priority, contradiction, competition and acceptability. The determination of the explanatory coherence of a theory is made in terms of consilience, simplicity and analogy. According to Thagard a theory is explanatorily coherent when it explains a greater range of facts than its rivals; fewer special assumptions are made and it is consistent with theories that have already found credibility with scientists. The theory of explanatory coherence offers grounded theory an integrated account of many of the evaluative criteria which are deemed important for theory appraisal by Glaser and Strauss.

Haig's reconstruction of Glaser and Strauss' account of grounded theory is not meant as an accurate report of grounded theory, but as a recasting of it. The abductive approach to method provides a framework for inquiry based on a scientific realist view of science. According to Haig (1995) knowledge is advanced by abductive explanatory inference by scientists, who are abductively generating theories to explain puzzling phenomena, elaborating their plausible guesses with analogical reasoning to appropriate models and appraising their theoretical efforts in terms of their explanatory power. Scientists are thus theory builders who are concerned with generating explanatory theories in order to obtain a representational grip on the world. The abductive approach to scientific method creates theories which comply with Thagard's (1988) stipulation for scientific theories to be adequate. They are practically adequate in that they can be shared by the wider community of scientists; they are historically adequate as they describe how theories develop over time

and they are philosophically adequate as they contribute to plausible solutions to other central scientific and philosophical problems.

3. 4. THE MICROGENETIC METHOD

The central feature of developmental psychology is the change that occurs during a lifespan. However, this feature has been an extremely difficult one to determine. There has been little progress in understanding change mechanisms, mainly because of the difficulty in devising effective methods. Appelbaum and McCall (1983) noted, "In contrast to other specialities, the study of development is the study of change....But developmental psychology has often not been truly developmental, and therefore it has not seriously faced the methodological issues unique to its definitional purpose " (p. 415). Siegler and Crowley (1991) suggest that theoretical progress is being made in understanding basic mechanisms, which in turn demands that progress be made in methods that will indicate in which direction research should be taken.

Most research that has been done in developmental psychology has only indirectly assessed change. Both cross-sectional and longitudinal designs tell little about the processes that produce change. Many researchers have hoped that these designs would be more informative as to the changes that occur over different ages. However, as Siegler and Crowley (1991) point out, these designs tell more about the stability of individual differences, than about the processes that caused the changes. The crucial factor in studying development is the density of observations during the period of change relative to the rate of change of the phenomenon. An example of a hurricane creating havoc on a town illustrates this idea. The overall effect of the hurricane's progress and destruction is better understood with before, during and after photographs of the town. Thus observation and measurement of ongoing changes allows one to analyse the relation between the damage being done and changes in wind pressures, cloud formations and other causal influences. Changes that occur in cognitive development follow a similar path. The development of understanding of liquid quantity conservation can be done with children of different ages. This indicates how children understand the

concept at each age. Likewise, the false belief test can be given to children of different ages and this would reveal how they understand the concept at each specific age. None of this would, however, show how the change occurred. Intense sampling of behaviours must coincide with the period during which the rate of change is relatively rapid. Observations would ideally begin just before the change began and would continue until a point of relative stability was reached. Changes that are closely age-linked are more directly observed when there is overlap between the period of dense observations and the period of rapid change. Most changes are not that closely bound to particular ages, with variability of age acquisition occurring in years rather than weeks.

The microgenetic method is one that is particularly suited to studying change. There are three features which define this method: 1) Observations span the entire period from the beginning of the change to the time at which it reaches a relatively stable state. 2) The density of observations is high relative to the rate of change of the phenomenon. 3) Observed behaviour is subjected to intensive trial-by-trial analysis, with the aim of inferring the processes that give rise to both the quantitative and qualitative aspects of change. The microgenetic method is a method that is typically suited to studying younger children, while still being suited to older children and adults. Its strengths lie in the dense observations and the verbal reports over a period of time, that combined, give valuable insight into the mechanisms that cause changes to occur. I discuss this method in detail because it is one of the few truly developmental methods available.

There are not many microgenetic experiments being conducted because they are not easy to administer and take a lot of time to conduct. Subjects are tested individually and videotaping of performances for each subject is required to determine when changes occur. However, despite all the impediments, they appear to be gaining more attention, largely because of the high quality data that they yield.

3. 4. 1. A Microgenetic Study Of Strategy Discovery

Siegler and Jenkins (1989) conducted a study on four and five year olds' discovery of the min strategy for adding numbers. This study is a good example of how the microgenetic method is effective with young children. A detailed description of their study is given as it will reveal how simple but effective this approach can be.

The min strategy is an approach to adding that involves counting up from the larger addend the number of times indicated by the smaller addend. A child using the min strategy to solve 2 + 5 would start at 5 and count upward 2 counts, the child would think "5, 6, 7". Groen and Parkman (1972) hypothesized that young children use the min strategy to solve single-digit addition problems. Their evidence was based on the size of the smaller addend being a predictor of solution times on different problems. They found that problems such as 7 + 2 elicited shorter times and problems such as 5 + 4, longer ones. To account for this finding, they proposed the min model. Variation in solution times was predicted to be a linear function of the number of counts upwards. Subsequent findings supported this, with the size of the smaller addend a good predictor of solution times.

Carpenter & Moser (1982) found that children reported using a variety of strategies, describing five or more different approaches. This divergence between self reports and the min model suggested that either the children's verbal reports were inaccurate, as Nisbett and Wilson (1977) suggest, or their verbal reports were accurate and the results did not imply consistent use of the min strategy. Siegler (1987) found that the min model was the best predictor of solution times as well as children reporting using not only the min, but also at least three other strategies. To find out whether the children were consistently using the min strategy or other multiple strategies, Siegler divided the solution times on each problem according to the strategy that children were classified as using on the basis of their verbal report and videotape of their nonverbal behaviour during the problem. Where children were classified as using the min strategy, the min model was a better predictor of solution times on each problem than past studies; where the children used a different

strategy, it was not a good predictor. This suggested that children use multiple strategies on problems where they said that they did. These findings provided background for Siegler and Jenkins (1989) experiment, by indicating an appropriate age group, assessment technique and description of typical development to provide an appropriate context for the findings.

The major problem with microgenetic methods is that the discovery or competence may not occur in the time available for study. In Siegler and Jenkins' trial, seven of the eight children made the discovery in the eleven weeks, however the time that they required varied. A common view is that discoveries will only occur on difficult problems that canot be solved in other ways; this is called impasse driven learning. Discoveries in this experiment, however, were inconsistent with this view. It was found that discoveries can occur while solving easy, difficult or moderately difficult problems. Most of the discoveries occurred on problems that the child had solved correctly earlier on and with no apparent difficulty. This points to the inadequacy in current approaches in cognitive development that most approaches depict change in terms of static states marked by occasional periods of change. Change has been relegated to a conditional status. However, the findings from Siegler and Jenkin's strategic discovery experiment seem to indicate change as the norm. This view of cognitive activity would allow for a view of mechanisms that produce a flow of variations from which innovations can emerge.

Discovery of the min strategy did not immediately lead to widespread generalization. It was used only occasionally at first, hence suggesting against popular expectation, that discovery of a new strategy does not immediately lead to its application. This is pertinent to much research that is focussed on finding the lowest age at which a child can display a strategy or competency. A first application of a new strategy does not necessarily confirm a mastery. There is a difference between the discovery and mastery of a strategy. Siegler and Crowley suggest that it is only as people use new concepts and strategies that they fully comprehend the advantages, disadvantages and conditions of their applicability. Understanding of the strategy only comes with its use. This is congruent with the arguments of Chapman and Chandler

(1991) who state that much research is focussed on a successful display of early competency, from which claims are then made about the child possessing a competence. However, this competence has yet to be generalized and so become a stable structure. Hence the need for a more developmental focus such as the microgenetic method, which would encourage a process orientation to the study of competencies.

The microgenetic model would be of use particularly with younger children, where sole reliance on their verbal reports is of limited value, given their limited linguistic repertoire. Likewise much research that has attempted to place children in the field and carry out observations has been inadequate in that it cannot explain the processes that caused the change. Dense observations of behavioural change as well as the focus on verbal reports which the microgenetic method offers, would seem to be the best approach to investigating younger children's competencies. It also allows for the earliest detection of the prediscovery phase, the actual discovery of the strategy and then the gradual generalization as the competency becomes stabilized. This often occurs over a longer period of time than most researchers are interested in. In short, the microgenetic method would enable researchers to reintroduce development to developmental research.

3. 5. NARRATIVE WRITING

Fox (1991) believes that the problem of whether children's knowledge of the mind is a product of spontaneous action and reflection, or whether it is a product of socialization, will never be resolved empirically. The extent to which children make their knowledge in this area explicit depends largely on the challenges and opportunities that face them. Literature is a potent form of representation of the mental world in literate cultures. Before the advent of psychology, mental phenomena were probably discussed in the contexts of religious and literary discourse. Children in most countries are nowadays introduced to narrative accounts of human behaviour from an early age.

Fox (1987, 1990) carried out a study into the representation of social cognition in children's narrative writing. Children aged seven, nine, eleven and thirteen were chosen to write two specially commissioned narratives, as well as a third piece of non-narrative writing. The written narrative can be viewed as consisting of one or more characters in an environment who take action in the light of a predicament. The predicament is resolved in some or other way.

The study was undertaken under the pretext of finding out what kinds of stories children write at different ages. Content analysis of characterisation was carried out on each story. Ratings corresponded to five levels of developing attainment: Level one was where a single character pursues simple goals and thought and action are not clearly differentiated. Level two was where characters interact physically and where thinking was about action. Level three involved thinking characters exchanging information with a self-reflective protagonist. Level four was where characters were realized as individuals with feelings and attitudes. At level five, characters were presented in roles and relationships at a generalized level.

Fox acknowledges that there are difficulties in arriving at unambiguous quantitative analyses of written stories. Some stories will produce writing which is more differentiated by age then others. The trends and principal findings, however, were apparent and warranted further inquiry. He found that seven year olds could only represent the very simplest states of knowledge and motivation with a single character. He found that when children of this age write stories they focus mainly on observable actions of characters and only introduce mental states when they bear directly on the wants and purposes of the characters. The nine year olds could be roughly split in half, with half remaining at level two and half at level three. Level two depicts stories that restrict mental states to a single character. The writer's focus is on the observable world of actions and their consequences. Those who reached level three could depict more than one character as having an inner world of thought.

Fox found that as children get older the distribution of attainments becomes more scattered. Eleven year olds were spread across all the

levels as were thirteen year olds. A few remained stuck at a level where there was minimal acknowledgement of an inner mental world and subjective point of view. This type of study is heavily dependent on the child's ability and skill in transcription, composition and decision making. The absolute ages at which different features of development are attained are of less interest than the nature of the course of development. Greater emphasis is on the development of communicative understanding and the representation of the inner world of thought and feeling. The more successful eleven and thirteen year olds accompany the world of action with an inner world of psychological experience. The common-sense ways in which we try to understand ourselves and others as people can draw on this interpretative tradition of plausible narrative readings more than on logical and rational tests of explicit hypotheses.

The narrative method of research is particularly useful with adolescents and children of middle childhood. Their linguistic skills are rapidly developing and have a great effect on the development of their communication skills. Research that tries to focus on children's understanding of mental entities relies heavily on the children's ability to communicate this linguistically. Narrative writing is another form of communication where children are required to struggle with their depiction of characters' mental states in their stories. This depiction requires that they articulate their understanding into a deliberate and conscious form or written expression. Understanding that is conveyed in narrative form might be more stable than that conveyed in verbal reports, as it requires more conscious deliberation. Narrative writing can be used in a way that is complementary to other methods. It does not have to be treated as a separate methodology as will be seen with the Brussels Method in the next section.

3. 6. AUTOBIOGRAPHY AS A PSYCHOLOGICAL METHOD

De Waele and Harré (1979) describe the autobiographical method, where an individual is assisted by a team in the production of a document which is a representation of how one views one's own life, knowledge, beliefs and principles of action and judgement. This method would not be suited to young children who have a limited linguistic repertoire, however is well suited to adolescents and adults. Much developmental research fails to discriminate appropriate methods for different age groups. While the microgenetic method is a general method, it is well suited to younger children, whereas this autobiographical method would be inappropriate with three and four year olds.

De Waele and Harré draw a distinction between an assisted autobiography and other forms of biography. Biographies tend to rely on first person information in the form of documents, whose interpretation is done by the biographer. The biographer's influence on the research is seen in the system of concepts that they impose on the contents rather than being drawn from the life of the subject. Further, an assisted autobiography is not a diary, which is a record that is compiled at the time incidents are recorded. An assisted autobiography does not have a subject; it is a cooperative exercise in revealing the life conceptions of the central participant and is a recollection and interpretation of episodes in a person's life and the author's relation to them.

An autobiography is a psychological method in which the biography is transformed by a team of experts who work with the participant in creating a document that represents their conception of their life. If there are universal features in the historical development of human lives, they can be demonstrated by comparing documents recording individual lives with respect to the themes that their construction has been based on. The meaning of episodes is derived from the interpretation of the people who participate in the episode; it is not imposed from without in a prior scheme invented by investigators. There is no manipulation of people as subjects in experiments. Participants' interpretations are taken seriously. Hence there is no

falsification of reality which occurs when things are prepared in advance by the investigator. This is a participatory methodology which recognizes that social interaction involves a variety of interactive mechanisms.

3. 6. 1. Neglect of the Method

The autobiographical method has been ignored by psychologists as questions about their objectivity, reliability and validity are raised, concerns which originate from psychometric theory. The initial autobiography is the result of the participant writing their own story. This however is only the first step. It is not a goal on its own, but part of a wider reconstruction. The data featured in the sketch are investigated further by specially designed interviews, where it is checked and compared with data from other sources. The validity of such a document is not dependent on its objectivity. It is desirable and necessary that the document contains data that reflects the attitude and interpretations of the participant. The participant's view of their own life situation is important in interpretation, as the meaning of specific acts only become clear when they are related to articulation of past experience.

Behaviourist research has tended to neglect the whole person and focus instead on fragments of unrelated aspects of personality. Little attention is given to subjects' own reports about their interpretations of their existence. The autobiographical method is a collaborative one where participants and investigators work in a team. Focused Account Eliciting interviews involve negotiation with the participant over accounts of their past experiences. Another reason why the autobiographical method has been ignored is because it contains developmental concepts referring to the continuity in an individual's development. The developmental concept is something that traditional research methods such as laboratory experiments have failed to incorporate, largely due to their restrictive approaches. Personal documents are also difficult to adapt to statistical methods and their application to detailed content analysis risks destroying the meaning contained in the document as a whole.

3. 6. 2. The Brussels Method

The assisted autobiographical method was developed in Brussels with convicted murderers. Its aim was to understand their lives in order to make sense of their acts of murder and to assess their potential for parole. The research team consisted of the participant, a prisoner, who as a volunteer received a salary along with the professional members of the team, which also included a sociologist, psychologist, medical doctor and so on. The task of the autibiography genesis is to learn about an individual's way of conceiving their life, their predicaments with a view to solving their problems.

The central participant is invited to write their own autobiography in their own terms, in their own time and to their own satisfaction. This text is then divided up into the number of time-slices that is the same number as members on the team. Each member then tries to reconstruct from their slice the rest of that life as it has so far been lived. This involves negotiation, where the participant negotiates their narrative with the professionals, which leads to new documents where revisions are incorporated. The negotiations occur between professionals and with the participant and the final product forms the basic text. This method has seldom been used in practice.

In Oxford, topic-orientations have been added to this time-oriented method. The naive autobiography is dismembered and reassembled according to a nine-fold thematic scheme. A Biographical Inventory is used, along with Problem and Conflict Situations (detailed in section 3.6.4) and Social Enquiry, a detailed investigation of the social and physical environment of the participant. The object of this is to make the reconstruction of the life-course systematic. The scheme consists of a microsociological framework which incorporates a time perspective, social ecology and socioeconomic living conditions. Social psychological life-patterns incorporate family and groups, the cultural pattern of values, norms, expectations and roles and the institutional (prison) situation. Individual characteristics involve self descriptions and interpretations, interests, occupational and leisure-time activities and the goals, aspirations and conflicts of the participant. These topics are connected with the Biographical Inventory. The investigator can

draw comparisons between the initial autobiography and the Biographical Inventory. This leads to a qualitative approach, with the emphasis on themes in an individual's life mentioned in the naive autobiography or explored in subsequent discussions. The emphasis is on the meaning the data has for the participant as well as for the other members of the team.

About ten successive readings of the basic autobiography are necessary. It is necessary for the team of experts to become fully familiar with the complete reading as well as drawing up an inventory of the themes that are dealt with in the autobiography. The document gets coded with respect to the appearances and reappearances of these themes. The data gets analysed under the topics of the scheme. Some data will get classified into more than one topic, which means that they can be considered from a different point of view and so their meaning is changed along with a change in perspective. The analyst has to consider whether subjects get attended to implicitly or explicitly by the participant in their autobiography. Explicit references comprise the manifest content of the autobiography, while implicit references cover topics which are supposed to be presented by the analyst. Each analyst forms hypotheses about the particular theme that they are dealing with. These are explored in comparison with other data sources, other investigators and with further accounts from the participant. The nine thematic readers and the participant now engage in ordering the sequence of negotiations as each reader tries to reconstruct the remaining themes on the basis of common sense knowledge. The participant is used to settle differences in opinion that have emerged in the reconstruction.

3. 6. 3. The Method of Negotiating

The Interviewing Rule is a fundamental constituent of the biographical method. According to this rule, every answer given to a question, every statement produced by the subject and all available documents about the participant, must be submitted to an interview, to make explicit the content and form of the constructs which the participant uses to describe and explain their life. The Focused

Account Eliciting interview allows the subject to produce supplementary documents. This interview uses a series of focussing techniques to obtain accounts from the participant. Its focus is on the generative mechanisms that lie behind behavioural phenomena, the written and spoken statements used by the participant and, through this, the various episodes that are named. This will lead to a reconstruction of the participant's cognitive resources. The interview is centred on the subject's experiences, definitions and the meaning they attribute to different episodes. These accounts serve to make actions intelligible by locating them within a structure as part of the biography or by locating them in the life-world. Ordinary accounts achieve meaning through settling the meaning assigned to the environment and actions and by referring to the rules of action as well as role requirements in monitoring social behaviour.

Meanings can be explicit or implicit. People's accounts of their doings usually involve reference to rules and other normative principles. Accounts elicited in these interviews are not responses to stimuli, but occur between people negotiating meanings in certain roles. The type of communication involved depends on how accounts are asked for and how they are given, accepted or rejected.

There are three stages in the focused account eliciting interview:
Stage one: Reflexive Questions
In the first stage of the interview reflexive questions are asked about the process of interpreting and answering the questions in written form. Accounts generated by these questions provide a general background which prepares the way for direct questions of the second stage. Non-verbal communication is carefully noted and recorded with reference to the context in which they occurred.
Stage two: Direct Questions
These involve informative questions whose aim is to collect factual knowledge about a specific topic. Ordering questions permit the team to make comparisons and classify data, while questions about choices between alternatives and possibilities induce the subject to explain how one alternative was chosen by them. Questions formulate the conditions under which certain events took place. Finally objections are regarded as alternative accounts which are proposed to the

subject, while flaws in their argument are offered to them and they are asked for their opinion.
Stage three: Reflexive Questions
These reflexive questions are aimed at the second stage of the interviews. The negotiation of accounts and underlying meanings are explored. The various types of argument and rhetoric used by the participant are discussed. The result of the Focused Account Eliciting and cross-negotiation is a new autobiographical text.

3. 6. 4. Problems and Conflict Situations

The new autobiographical text is used to identify longitudinal themes. The development of lives studied in the Brussels report is characterized by conflict and crisis situations. The biographer has to grasp the structure of the situations as conceived by the participant and the way they try to resolve them. The participant is asked to identify situations in their life which have the same characteristics as certain standardized conflict situations experienced in the prison and which have been artificially constructed by the team for his or her benefit. The participant is asked to experience a range of conflict situations of increasing difficulty, the last being highly stressful and insoluble in the given conditions. The participant is then asked to pick out situations in their life story that are similar to the conflict situations they have experienced in prison. The individual therefore relives part of their life again in terms of common features that he or she has identified for themselves. The autobiography is then seen to be an interpretation of happenings and responses, and not a record. According to De Waele and Harré, the autobiography provides a cognitive map of how the individual now represents their life to themselves and the resources by which they have coped or failed to cope with their problems. Autobiographical accounts are concerned with accounts that allow a representation to be formed of a person's current cognitive resources. This method, like the microgenetic method, takes a long time to unfold. The quality of the data, however, should compensate for this.

Much current research in psychology is done within a paradigm which allows for the relatively quick confirmation or disconfirmation of the

statistical null hypothesis. Quality research would seem to require more time to be spent than is currently catered for in the research sector of tertiary systems. Collaborative or team research that focuses on problem areas would encourage a more wholistic attitude to real-life problems. Every researcher would be a valuable member in a system that was guided by problems. Thus research would be potentially valuable regardless of whether it produced statistically significant conclusions.

One of the central tasks of a scientist is to explain puzzling phenomena that occur and to this end research can be regarded as a problem-solving endeavour. The abductive account of method seeks to explain the causes that lie behind phenomena and generates theory from robust data patterns. However, this can only be done once the phenomena have been adequately investigated. The testing of the theory occurs a long way down the track compared to the practice of immediate testing with the hypothetico-deductive method. Researchers have, until very recently, used a range of quantitative tools that have limited the kinds of models and theories they have been willing to entertain. The tools that have been used in experimental research have lent themselves to being easily measured or manipulated and are interactive only in an additive fashion. They have not been suited to handling reciprocal processes and complex configurations. Researchers have not looked at phenomena as patterns and systems as they have not had the appropriate tools to explain them. With this in mind, this chapter set out to present an overview of different methods that can be undertaken when dealing with different types of phenomena. There is a need for a sensitivity in choice of method when dealing with different types of problems. An example is the limited linguistic repertoire of a child, which is seen in theory of mind research. An approach like the microgenetic method could be considered in this case, as it is not overly reliant on children's verbal responses.

The need for creativity in research has resulted in this work treating logical positivism as a whipping boy (Piaget, 1980). This would necessitate a break with the old hypothetico-deductive approach, a legacy of the logical positivist paradigm. The focus would shift from

being overly concerned with superficial observational levels to real life problems. It would expand the notion of psychology as a science from one where researchers are concerned with testing and verification of hypotheses to one where they are actively engaged in solving problems and generating theories as it attempts to explain underlying causes of phenomena.

Conclusion

Chandler and Chapman (1991) describe the common way of ending a piece of work, where central themes running through the various chapters are highlighted. The purpose of this is to hopefully draw some conclusions regarding the current state of knowledge about the specific topic. Like Chandler and Chapman, I believe that the decades of debate over psychology's current view of science and the resulting methodologies have failed to reach consensus, as well as the routes by which agreement might be reached.

This work has shown how current methodologies used with children in developmental psychology maintain an adherence to the logical positivist tradition. Hooker (1987) states that the methods that are accepted in research are a function of which theories are accepted. Thus, breaking with the logical positivist paradigm with its method of hypothesis testing and embracing another view of science, entails that there will be fresh approaches made in the field of methodology. The challenges that a change in scientific method would bring seem to discourage researchers from abandoning their logical positivist roots.

The goal of this work has been to retrace the historical context of the current impasse in developmental research in the hope of finding a way around it. The ideas of Piaget and Vygotsky have been explored in the hope of questioning old solutions and drawing out potentially positive implications from their ideas. Much of Piaget's work has tended to be dismissed, with new students being urged to discount his outdated views. This tendency to discount ideas from the past is shortsighted and ill-informed, for such ideas might help inform a new critical view of science. The controversies surrounding Piaget's theories still have to be clarified conceptually, before they can be settled empirically or methodologically. Haig (1995) has pointed out that a major problem in current research is the tendency of researchers to test theories prematurely. A central feature of much of the research being done with children is the role of the scientist in fixing the meanings of explanatory concepts. Clarification of competence as an explanatory concept is needed before claims about its manifestation can be made. Before one can detect a particular

competence, one must have some conception of what one wishes to detect. Chapman and Chandler (1991) claim that instead of measuring the same competence with different assessment procedures, researchers often measure competencies which are conceptually distinct from each other. Researchers need to move beyond the question of the true age at which a competence first develops to what exactly it is that develops at different ages. Thus we need unambiguous criteria for distinguishing between different competencies that may be manifest in a single task.

By contrast, many of Vygotsky's ideas are being enthusiastically received, but they tend to ignore the context in which they were worked out. His zone of proximal development is one area which seems to be getting a lot of attention. However it was not meant as a place or a setting in which to situate research as most seem to regard it. Vygotsky held the view that science is a critical activity that has the potential to liberate people. Many of those attracted to his conception of zone would find this transformational notion of science unacceptable and possibly quaint.

The fact that science might be regarded as a cultural invention is one that deserves attention. Hooker (1987) claims that science can be seen as an adaptive mechanism for coping with survival, a modern day person's equivalent of the caveman's tool. Science, indeed, may be relative to given cultures. Bruner (1991) describes how the current cognitive revolution in psychology has replaced the concepts of meaning and construction with information and processing notions. He claims that psychology has been technicalized and trivialized.

At the present day the discipline of psychology could be described as a largely white, middle class endeavour. Some (Gergen, 1973; Sampson, 1977) claim that psychology has been constructed to reflect the ethnic and class values of psychologists themselves. If psychology and indeed developmental psychology is to endure, it needs to recruit students of diversity to represent perspectives of diverse populations. Meacham (1996) claims that the quality of training programmes, the conduct of science and the contribution of research to society will be enhanced if psychology includes more students with varying life

experiences. Developmental theory likewise needs to be transformed to emphasize the various historical, social and cultural contexts in which development takes place.

One theme that emerged in Chapter One was how, despite the inadequacies of the logical positivist approach to psychology, its methodolgies are still currently practised. Despite its lack of concern for the situatedness of human beings in a socio-historical context, and its failure to accommodate this in its laboratory paradigm, it is still the dominant methodology of the day. Scientific realism was offered as a solution to a breaking from the old paradigm. Yet its methodologies are in their infancy. Such methodologies would not be heavily based on hypothesis testing and verification as there is a need for methods that go beyond that particular part of the research process. Hooker makes the point that there will always be uncertainty about scientific method as it is always chosen and implemented in a specific historical context.

A related issue was raised in Chapter Two where the role of children in research was discussed. The notions of childhood and development were seen to be influenced by a logical positivist orientation. The child was valued for what it could bring to the laboratory, and the context in which its competencies were acquired and displayed were either ignored or simply treated as variables. The true nature of development has not been dealt with by psychological researchers who have been hamstrung by a commitment to positivist methodologies where the focus has been on change as a static entity that is addressed to different ages. This latter commitment has led researchers to focus on age related changes; once again the focus has been on the change as an event. This has resulted in current research finding ever earlier ages at which competencies are found. Theory of mind research is an example of this, with a flurry of tests being devised to test whether a child accomplishes a false belief test successfully at a particular age. The first sighting of a competence is taken as the successful formation of a competence and it is treated as an emergent construct. It is suggested that this should be accommodated into a truly developmental perspective, with the first evidence being seen as a small step in the establishment of a

competence, rather than being treated as a full blown competence. This would encourage a genuine developmental attitude in developmental psychology with the tracing of competencies' generalisation and maturation over a period of time. Once again, researchers would do well to take note of Piaget's approach to human development, which was genuinely developmental, with his view of progressive transformation, differentiation and integration. He saw a fundamental continuity between biological and psychological integration as well as within psychological functioning itself. This lends itself to an approach that shifts the focus away from an emphasis on product, towards one where the focus is a process orientation. This is a developmental notion, which up until recently has viewed development as a series of static changes.

The current focus in theory of mind research has likewise treated mental representations as static entities within the mind. There has been a concern with the products of concept formation and not their developmental course. Cognitive structures have been regarded as products of the developmental process. This desire for objectivism in methodology has been a result of the positivist inclination to focus on knowledge as part of an objective reality that we can come to know. The connection between knowledge and interest has been ignored or avoided. According to Habermas (1971) this view of knowledge as an objective entity must be discarded, so that the connection between knowledge and interest might be acknowledged. Knowing then becomes more important than knowledge. Scientific realism's notion of humans coming to know the world as they quest for it, and evolutionary naturalist realism's view that humans come to know the world as they interact with it, lend themselves to this process orientation.

A scientific realist view is able to accommodate the study of generative mechanisms that cause change. Thus the focus is on the structures behind the change and not the change events themselves. Piaget affirmed the existence of such structures, describing them as 'causally active' (Piaget, 1941, p.217). Theory of mind research, however, looks to the successful performance of the child to convey the presence of a competence. A related issue is whether a

competence should be regarded as an attribute of the individual alone or as a relational characteristic within a particular social and ecological context. The traditional assumption has been that competence resides within the individual. An alternative view is offered by Vygotsky in the 1920s and Meacham (1991) where competence is regarded not as a property of the individual child, but as a complex that includes the child as well as the social supports available to them. Hooker (1987) likewise believes that many of our competencies might be species capacities rather than individual capacities. This would shift the research focus away from the individual towards the interrelations among people. This point has implications for methodologies as well as incorporating a perspective which allows for the explicit consideration of social, cultural and economic factors.

The motivation behind asessments with children is called into question by Meacham (1991). He sees assessments with children as primarily being motivated by the need to intervene and control. He likens the treatment of children to nature, two forces over which humans freely exert control. Hooker's (1989) evolutionary naturalist realism is a view of science that counters this attitude with its anti-anthropomorphic view of humans. His theory of science sites humans in their evolutionary context rather than in a position of privilege. In considering the global context in which they function, humans would see themselves as a part of nature and not apart from it.

While some researchers are slowly acknowledging the family as an appropriate context in which to investigate children, the traditional family is ironically becoming more and more of an anachronism (Kessen, 1993). The structure of many families at the end of the twenty-first century is changing all the time. The modern family with its many varieties is a difficult context to research, and one for which traditional methods are not particularly suited. A scientific realist approach would be able to facilitate the task of investigating these changing realities of the family context by approaching them abductively as a problem-solving endeavour. It is crucial that these realities not be placed in the 'too hard' basket and that they be regarded as worth investigating. It is a major challenge for science to

provide researchers with methodologies that will assist them in their complex tasks of investigating children in their operating contexts.

Chapter Three investigates the different methodologies that could be used with different age groups. The abductive approach to scientific method (Haig, 1995) can accommodate these methods, by offering guidance on problem-based inquiry. The microgenetic method seems to be one of the few truly developmental methods. It focusses on change as it occurs and seeks the conditions and occurrences just before, during and immediately after a change is noted. It is aimed at accounting for the mechanisms that generate these changes. Whilst there are few microgenetic studies being conducted, it is to be hoped that the quality of data, research practices and conclusions that they produce will encourage researchers to use it more widely. The conduct of research in institutions will need to make better provision for research which takes more time, uses more team work and produces more useful and better quality results. For example, Piaget (1929) recommended that clinicians working with children be trained for at least a year in order to become proficient in talking to children in clinical settings. Most research that is presently undertaken with children sees talking with children as requiring no special skills or understanding. Acknowledging that this is an area requiring specialized skills would prolong the time and effort needed for research in this area. The current ethos argues against this type of research; however, such a change in attitude would surely help bring about the needed improvement in the quality of developmental research.

Psycholgy's desire to be accepted as a hard science and to be included in Comte's hierarchy of scientific knowledge along with social physics, physiology, chemistry, physics and astronomy, has led to it adopting a course that has both determined and restricted its theoretical and practical research. This has likewise led to its desire to be treated as a separate endeavour from philosophy, thus rejecting its metaphysical origins. In its desire to win credibility and status along with the hard sciences, it adopted a view of science which has had a logical positivist orientation. The validity of observational facts and statements assumed primary importance. Subjective experience belonged to the

realm of philosophy, which was deemed unscientific. Experimental psychology grew out of this milieu with its view of people as being passive objects whose behaviour could be explained under closed systems in the laboratory. Anything that affected this procedure was deemed to be a nuisance variable. This has led to the reductionist approach which was based on the epistemological stance of breaking down complex phenomena. Salomon (1996) describes how each psychological phenomenon or state of mind is conceptualized and studied as an entity unto itself. The decontextualized individual has been the object of much American psychological research this century. When the individual enters the laboratory they leave behind most of what makes them who they are. The cognitive revolution has reinforced this trend with its focus on ever smaller intra-individual and mainly context-free units of analysis (Prilleltensky, 1989). This self-contained individualism is not a fundamental psychological principle, but a cultural and historical thesis. Alternative conceptualizations are possible and necessary if psychology is to make a contribution to resolving contemporary social issues (Sampson, 1977).

Instead of viewing itself as being in a privileged position as both a natural and social science, psychology has sought to restrict research according to the view which sees knowledge as part of an invariant order, which we can come to know if we have suitable measurement tools. This has stifled research theoretically and practically, with the products of such research having little connection with the reality outside the laboratory. Psychology has chosen to restrict itself to superficial observational levels and has left itself little credibility in the changing face of the reality outside the laboratory window. I have argued that it has to confront real problems and real people within the historical, social and cultural contexts in which they operate, before it can hope to assume credibility. Although psychology is in a privileged position of being in part a natural and in part a social science, this has not liberated it beyond the realms of observational knowledge.

Psychology has to abandon the logical positivist influence and its focus on the decontextualized individual and seek to embrace a wider

notion of science which will not restrict its theoretical and practical development. In the 1920s and 1930s Vygotsky argued for multiple forces of development each with their own set of explanatory principles. Human behaviour does not occur within closed systems and so researchers have to accept that there will be no exceptionless empirical regularities to discover. Assessment of theories will have to be explanatory and not predictive. We do not acquire knowledge of the world simply through hypothesis testing and induction, but through a cooperative enterprise of related persons (Gergen, 1985). Many years ago, Vygotsky pointed this out in his argument that psychological functions occur first on the social plane and are only then taken onto the individual plane. Theory of mind research would do well to research children interacting with their caregivers, for context reflects the reality of the child's thoughts far more accurately than a laboratory with a stranger who offers hypothetical situations.

We need an integration of theory development with an improvement in practical research. This will only occur when the unit of analysis seeks to reflect and not reduce the complexity of the phenomena. McGuire (1973) believes that once humans are studied as real-life composites, theoretical and practically oriented questions will merge. Vygotsky urged for the study of the historical child, emphasizing the importance of the historical, social and cultural context. Context, however, is not something that can be separated from a person; it reciprocally affects humans' thoughts and actions. Likewise the competencies and skills that humans are assumed to be endowed with are situated in immediate contexts of practice. This makes a mockery of research that attempts to discover skills and competencies which reside within the individual and ignores context. Individuals and their mental states cannot be studied in isolation nor out of their social and cultural context. Credibility will return to psychology as it directs its attempts at a multiplicity of problems that are occurring within the larger world. This will allow psychology to have both a critical and a transformational role to play in the twenty-first century.

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